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A QUARTERLY OF CLINICAL LECTURES

ON

MEDICINE, NEUROLOGY, PEDIATRICS, SURGERY,
GENITO-URINARY SURGERY,
GYNÆCOLOGY, OPHTHALMOLOGY, LARYNGOLOGY,
OTOLOGY, AND DERMATOLOGY,

BY

PROFESSORS AND LECTURERS IN THE LEADING MEDICAL
COLLEGES OF THE UNITED STATES, GREAT
BRITAIN, AND CANADA.

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Medicine.

A CASE OF EMPYEMA, WITH SPECIAL REFERENCE TO TREATMENT.

CLINICAL LECTURE DELIVERED AT ABERDEEN ROYAL INFIRMARY.

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THE case which I now bring before you illustrates so many interesting points, especially in regard to treatment, that I choose it as the subject of my lecture on this occasion, although it occurred at a time when most of you had not the opportunity of seeing it. The history, and the physical signs as at first observed, led me to an impression regarding the case which later observation did not confirm, and you will see in the sequel what an important bearing this had both on treatment and on prognosis. The patient was a young man, aged twenty-one, by occupation a cooper. All that he could tell us regarding his family history of any importance was to the effect that his father had died of a tumor in the head at the age of forty-five, and that one of two surviving brothers had suffered twice from "inflammation of the lungs." As to personal history, he had measles and mumps in childhood, and eighteen months ago had an attack of inflammation of the left lung, from which he was stated to have made a good recovery. Six months since he got wet, and the pulmonary attack was repeated, confining him to bed for about a fortnight. From this also he recovered, and was in fair health up to the date of the present attack.

History of the Present Illness.—On April 17 he complained of chilliness and general malaise, and on the following morning he awoke with a sharp pain in the chest, felt most on the left side. With this there was hurried respiration, and some cough accompanied by blood-stained expectoration. When this attack had lasted about a week he became delirious, continued so for nearly a week, and then began to improve. After the lapse of a fortnight he began to go back again in health, and about a week before admission cough became troublesome, and in the

night he perspired profusely. At the same time pain in the left side became acute, and since then has varied in severity, but never altogether left him. He has felt himself becoming weaker, and states that he has lost flesh.

On admission on June 8, he was seen to be anæmic and poorly nourished, of dark complexion, complaining of pain over the left side of the chest in front and in the lower axillary region, with occasional pain also behind; shortness of breath; occasional sweating; loss of appetite; together with cough, and a slight amount of expectoration. His pulse numbered 96, his respirations 28, and his evening temperature was 101° F. As regards the chest, the movements in front on the left side were somewhat limited, and slight flattening was observed under the clavicle. Resonance was impaired over the upper third of the left front; over the same area the breath-sounds were wavy and bronchial in character; lower down they were very faintly heard, and friction-sounds were audible below and external to the nipple.

Posteriorly the resonance was impaired all over the left side, especially towards the base; breath-sounds were diminished and accompanied by scanty crackles; breathing was harsh over the upper part of the right lung.

As regards the circulatory system, the heart's sounds at the apex (which was displaced to the right) were very feeble, but free from murmur; the second sound was accentuated over the area of the pulmonary valve; and in the jugulars a venous hum was heard, loudest on the right side.

The other points in the examination may be dismissed in a few words. The tongue was slightly coated, appetite fair, thirst considerable, bowels constipated. The hepatic and splenic dulness were normal; the urine had a specific gravity of 1021, was alkaline, deposited phosphates, and was free from albumen and sugar.

The impression which the case gave me at this point was that it was one of phthisis, complicated by pleural effusion of moderate amount, although examination of the sputa for tubercle-bacilli gave only negative results. In accordance with this view, the treatment consisted in the application of iodine liniment to his left side, and a mixture containing two grains of quinine with ten minims of dilute sulphuric acid, together with a pill of extract of belladonna (one-third of a grain) and zinc oxide (two grains) at bedtime to check night sweating. The question of removing the fluid by aspiration (generally inadvisable in tubercular cases) did not press for consideration, as it was not apparently in great amount.

Time passed, and the patient's general condition improved, but his temperature still rose at night, the resonance of the left side became more markedly impaired, and the heart showed more displacement towards the right. His breathing also was shorter, and he complained of more pain over the left front: so that it was obvious the fluid was increasing in quantity.

On July 18 the following note was made. General condition much as before. Patient complains of pain in the chest, which shifts its position from day to day. Dulness is well marked over the left front nearly up to the clavicle, and at nipple-level it passes somewhat to the right beyond the sternal border. Just above the base of the ensiform cartilage friction-sounds are heard synchronous with the heart's sounds, and loudest during inspiration. They are much diminished, if not altogether removed, by cessation of respiration. Posteriorly resonance is impaired over the whole of the lung, and crepitant sounds are audible on inspiration, finest and most abundant in the left axillary region.

During the next few days there was rather more shortness of breath complained of, but less pain; and along the right border of the sternum, opposite the second, third, and fourth costo-sternal articulations, well-marked friction-sounds were heard, with cardiac rhythm, continuing even during cessation of respiration. The rounded border of the spleen was felt half an inch below the costal margin in the nipple-line. Crepitant sounds were heard over the left back generally, as well as breath-sounds. The percussion dulness extended up to the clavicle, although in the first interspace it was not absolute, and breath-sounds of bronchial quality were heard at the extreme apex. It was obvious now that the time had arrived when removal of fluid had become necessary, both on account of the increasing gravity of the symptoms produced by its mechanical pressure and to clear up the question of its character, which was now suspected to be purulent.

A small trocar and canula were accordingly introduced in the fourth interspace, just outside the nipple, and on aspirating a small quantity of pus was withdrawn. This, however, soon ceased to flow, probably owing to blocking of the cannula by lymph, and, in view of the necessity of having a free opening made and drainage established, it was not thought necessary to persevere with the aspiration.

An unavoidable delay of a few days took place in the arrangements for surgical treatment; and meantime the cough became more troublesome, and the patient expectorated a quantity of purulent matter, which evidenced the rupture of the empyema into the lung.

On July 27 the empyema was opened at my request by Dr. Garden, one and a half inches of the sixth rib being removed just in front of the mid-axillary line. A considerable quantity of perfectly sweet pus was evacuated, and a large drainage-tube introduced. No washing out of the pleural cavity was practised. After the operation the cough rapidly subsided and the expectoration ceased. On the following day the morning temperature was 97.5° F., the evening 98.4°, pulse 96 to 112, respirations 24 to 34.

On the day after the operation the patient passed from my care, and I did not see him for a month, during which he had made such satisfactory progress that the drainage-tube had been removed and the discharge had ceased. A few days after its removal, however, while he was straining at stool, a sudden reopening of the wound took place and a copious gush of pus escaped, and this was repeated on a subsequent occasion.

On seeing him again on August 29, I found that the discharge had recurred for the third time, to such an extent as to soak through all the dressings, and on making him cough, a thin, sero-purulent fluid was expelled through a small opening in the centre of the wound, into which a probe passed readily for about five inches in a forward direction. This opening was rapidly dilated with soft catheters of increasing size, and finally a piece of india-rubber tubing three eighths of an inch in diameter and three inches in length was introduced, and fixed in position with a safety-pin and tape. About three ounces of thin, sero-purulent fluid, at the last blood-stained, flowed from the opening during these manipulations. He was ordered out of bed, and to go into the open air when the weather should be suitable.

Physical examination of the chest at this time showed drooping of the left shoulder and considerable flattening of the left side, mostly about the anterior apex, with markedly diminished movement. Resonance was somewhat impaired, and breath-sounds feeble, especially in the neighborhood of the wound and towards the base; no adventitious sounds were heard except an occasional rhonchus. The heart's apex was not detected by palpation, but was judged by auscultation to be in the fifth interspace, midway between the border of the sternum and the nipple-line. The first sound was rough towards the base, especially to the left of the sternum; the second was accentuated; and both were heard with abnormal distinctness towards the apex of the left lung.

On September 3 an inch was cut off the drainage-tube, and on the 6th it was finally removed, the discharge having practically ceased. A

few days later the wound was found to have become completely healed, he was gaining steadily in weight and strength, and he was sent to the convalescent home on September 19.

In commenting on the foregoing case I may dismiss the question of diagnosis with the remark that it would have been well to have ascertained the character of the effusion at an earlier date, although, believing that tubercle underlay the pleural effusion, I was reluctant to interfere at all with the pleura until compelled by the amount of effusion. In saying this it should also be noted that there was nothing in the aspect of the case which at first suggested pus rather than simple serous effusion; and that it is impossible even in the full light of the development of the case to dogmatize upon the absence of a tubercular basis for the disease.

But in the matter of treatment, which is the most important for present consideration, I wish to refer to several points which are of general interest in such cases, and upon which it is desirable that you should have definite ideas with a view to your future practice; premising that the result of our present case is health re-established, with only some retraction of the chest and drooping of the shoulder of the affected side, inferring, however, more or less diminution of lung-power.

And, first, there is the necessity for a free opening. Aspiration will not do, although it may succeed in rare cases; generally, it is simply a waste of time. It may, however, sometimes be required in cases of great urgency, to give immediate relief pending arrangements for the more radical operation. Here it is, of course, only preliminary, not curative.

Still less will it do to let the case alone on the chance of nature's effecting a cure through the patient's expectorating his empyema after it has burst into the lung. Even if such a rupture has taken place (as it did in our case), the sooner it is drained externally the better, because the longer the pus is allowed to pass through the lung the more likely is it to set up disease in the lung itself, the less likely is ultimate cure, and the greater is the risk of lardaceous disease supervening from prolonged suppuration; and similarly, if the empyema should rupture externally it should still be freely opened and drained without delay.

As to the site for opening, the principal point to keep in view is that it should not be too low, for then the ascent of the diaphragm, which gradually takes place as the empyema cavity becomes obliterated, may interfere with free drainage. I have always been in favor of the axillary site over the sixth rib, which was the spot chosen in the present

case, in preference to a more posterior and lower opening; but some authorities whose opinion is entitled to great weight prefer the latter. In either case, so long as freedom of drainage is secured, the results will probably be equally satisfactory. Then I think that the routine removal of a portion of a rib is a practice entirely to be commended. It insures the freest possible drainage, facilitates the introduction of the finger for exploratory purposes, and enables the operator to remove thick flakes of lymph which are often present and might interfere with subsequent drainage; and I am not aware that the procedure has any counterbalancing drawbacks.

Some years ago the expediency of making more than one opening was much debated; but if one is made large enough, a counter-opening, as it is called, is quite unnecessary. I cannot recall any case of which I have had charge in which more than one opening has been made, and I have never seen any disadvantage accruing.

You may have observed that in referring to the operation on our patient I stated that the pleura had not been washed out. I wish to emphasize this fact, because I have long held the opinion that, with rare exceptions, it is a procedure which is useless, and may be dangerous. The washing out of the pleural cavity has in a good many cases been followed by attacks of an epileptiform character, ending in death. A case which first called my attention to this occurred in the Middlesex Hospital when I was resident there, and was recorded by Dr. Cayley, the physician in charge at the time.¹ The patient became suddenly pale and unconscious when six ounces of a weak solution of iodine had been introduced into the sac of an empyema "which would have held twice as much;" convulsions succeeded, with widely-dilated pupils, profuse sweating, and a rise of temperature to 107° F., and the patient, a man, aged thirty-six, died sixteen hours after the seizure. No lesion was found post mortem to account for the symptoms. More recently a case of empyema² under my own care, in which daily irrigation of the cavity was being practised, was seized on the eighth day after the free opening of the pleural cavity by convulsions of an epileptiform character. These were succeeded by drowsiness and headache, with left hemiplegia, due to abscess of the brain, which proved fatal in a fortnight. In this case the fit did not occur till three hours after the irrigation of the pleura, so that the causal relation of

¹ Transactions of the Clinical Society of London, vol. x., 1877, p. 16.

² *Vide* Proceedings of Medical Society of London, "A Case of Empyema with Cerebral Abscess," vol. ix. p. 189.

the irrigation to the attack may be doubted. At the same time it is quite conceivable that the manipulations necessary during the irrigation, and the pressure of the irrigating fluid upon the lung, might have loosened a small thrombus in a branch of the pulmonary vein, which a subsequent movement on the part of the patient, or coughing, might have set free to find its way into the heart, and thence into the brain. So I should say that, except in cases where the pus is very fetid or the pleura contains a quantity of flaky lymph, the possible advantage of irrigation is not worth the risk run. And even in fetid cases the free opening and drainage will speedily cause the fetor to disappear.

Lastly, as to the time for removal of the drainage-tube and allowing the wound to close, no definite rule can be laid down. When it has been so shortened as merely to enter the cavity, the amount and character of the discharge must be our chief guides. And the use of a clean new soft catheter or bougie as a probe will furnish us with useful information concerning the size of the cavity and the directions in which it extends. When we have any doubt, it is better to leave the tube in too long than to remove it too soon; and sometimes the case is settled for us by our finding the tube expelled when the dressings are removed some morning, and the opening so rapidly contracted that it cannot be reintroduced. In such instances we give the case the "benefit of the doubt," and the result may be quite satisfactory.

The deformity produced during the process of healing, by contraction of the affected side, is in the case of adults almost necessarily permanent; but something may be done to minimize it by the practice of mild gymnastic exercise during convalescence. And in the case of children, if the treatment recommended is taken in hand early there will probably be no deformity resulting at all. The great points to be kept in mind in all cases are promptitude and thoroughness.

TRAUMATIC SYNOVITIS OF THE SHOULDER-JOINT; DISSEMINATED SCLEROSIS.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY HOSPITAL, PHILADELPHIA.

BY WILLIAM PEPPER, M.D., LL.D.,

Professor of Medicine and Clinical Medicine in the University of Pennsylvania.

GENTLEMEN,—This patient fell from a wagon five weeks ago and hurt his shoulder. He had been perfectly well until then. He went to a physician, who told him that he had “dented the bone, mashed the nerve, and strained the leaders.” He has bathed the part with liniment for five weeks, but without improvement, and has finally come to me for treatment, though his case is in many respects a surgical one. It is one of the curious tendencies of human nature to think that persons who know something about one subject must be good judges about everything else. A man becomes known as a good surgeon,—a person is taken sick with pneumonia and the best medical advice is used, and then as a last resort they consult the noted surgeon. You will be worried and pestered, when you have acquired a special reputation, by people insisting upon your giving opinions upon subjects with which you are not specially familiar. There are few subjects I should be less willing to express an opinion upon than injuries about the shoulder-joint. Yet it is often not a bad thing, after a case has been troublesome, to have an opinion that is not an expert one, but simply a common-sense view of the case. Sometimes things come out in the examination that are rather extraordinary.

I shall spend a few minutes on this case, for two reasons. The history this man gives is the kind of story that you will frequently hear. I have had many patients come with just such a history, who have adopted similar treatment and cannot understand why they do not recover. Again, I have seen such cases in later stages, when more serious consequences have followed and there has been wasting of the deltoid from disuse, with dropping forward of the head of the bone, the appearance presented being that of subluxation of the head of the humerus. In these cases it is often asserted that such was the original

condition, that the physician failed to recognize it, and as a result the arm has been rendered useless, and the patients vow that they will have vengeance. What the physician told this man was exactly right. He has "dented the bone, mashed the nerve, and strained the leaders." If there were a fracture it would be recognized by crepitus. If there were luxation you would recognize it by the inability to perform certain motions, and also by the change in the contour of the joint. Even though there be no fracture nor dislocation, yet the joint may be severely injured and serious consequences may follow. There is a great tendency to refer the symptoms following such an injury to rheumatism. The first result of an accident of this kind is a traumatic synovitis. This causes possibly a little effusion, but more frequently a sticky state of the synovial membrane, with alteration of the secretion and a tendency to the production of false ankylosis. This tendency is increased by the fact that the patient naturally does not move the arm because it hurts, and is told to keep the arm quiet because he has "rheumatism." This, of course, favors the formation of adhesions. So it often happens that when such cases come to you, although the bone is in its socket, you find that when you fix the scapula and try to raise the arm you cannot bring it above a certain point. In the present instance the arm goes up without much difficulty. These movements must be made with care, for a reason to which I shall refer later. There seems to be here little or no ankylosis. In making these movements it is necessary to hold the scapula immovable. If there is adhesion between the head of the humerus and the glenoid cavity, and you raise the arm without holding the scapula, the arm can, on account of the mobility of the scapula, be moved to a considerable extent, although the ankylosis may be close. It may be that the adhesions will show themselves only when the hand is carried across the back. When I do this, I find that the patient complains of pain when I reach a certain point. There is evidently a little adhesion between the synovial surfaces of this joint. False ankylosis is, however, a frequent result, and this will often occur even where there has been no traumatic cause, but simply an idiopathic synovitis from exposure. As a result of the inflammation and the pain, the patient keeps the arm quiet, and the result is—adhesion between the two surfaces of the joint.

We find, again, that if there is adhesion the bone is very apt to become adherent with the arm in a dependent position, dragging a little forward and downward, pressing on the synovial membrane; or if the arm is simply kept quiet, without there being much adhesion,

gradually the deltoid wastes on account of lack of use. It relaxes, and the arm drags the head of the bone forward and it impinges upon the anterior surface of the synovial membrane. Right over this pass the branches of the brachial plexus of nerves. In this region also passes the long head of the biceps. The irritation extending from the synovial membrane to the sheath of the tendon and the sheaths of the nerves, an inflammation of the tendon and also a perineuritis are set up. This perineuritis and inflammation of the tendon are the causes of the pain extending down the arm, referred to the lower portion of the humerus and to the forearm and also to the fingers. Exercise will often cause a tingling to run down the arm in the line of the radial or possibly in the distribution of the ulnar nerve. This pain may be so severe that the patient is absolutely helpless. Every movement, by pressing the head of the bone upon the tender nerve, causes thrills of pain so severe that the patient is compelled to keep the arm quiet. Such patients often come with the arm bandaged, suffering with what they call severe rheumatism of the shoulder. The quieter they keep the arm the worse it gets,—the more the deltoid wastes, and the more the head of the bone presses on the nerve. If the case goes on, there will be atrophy of all the muscles of the shoulder-joint. In the later stages, these cases will come with distinct flattening of the deltoid prominence, and wasting of the scapular muscles and of the muscles of the forearm. In extreme cases there is almost complete muscular atrophy, with pain in the line of the nerves, and swelling of the ends of the fingers from venous stasis, and the arm is entirely crippled. It is on account of these serious consequences that may follow synovitis of the shoulder-joint, whether traumatic or idiopathic, that I dwell upon this apparently trivial case. I do it to emphasize the practical lesson which I sought to impress upon you in the case, shown two weeks ago, of the young girl with rheumatoid arthritis, where I pointed out that the tendency was to destructive changes in the tissues of the joints, with firm ankylosis. The only salvation for these patients is proper manipulation. Make the joints go through the physiological movement. Break up adhesions.

The treatment of a case like the present one consists of vigorous efforts to cure the neuritis (which is a serious thing), in combination with careful manipulation to maintain the normal movements of the joint. You must be careful that the movements are not rude. Even where there is advanced adhesion I do not approve of etherization and breaking up the adhesions by violence, but prefer daily persistent manipulation, gaining little by little. The joint is so weak that if

violence is used fresh inflammation and fresh adhesions will be caused. In a case like this, where there has not been ankylosis, it is enough to use gentle manipulation every day. This should be done in a cautious manner, short of producing severe pain. You do not want to drive the head of the bone against the inflamed nerves. You want rather to draw it away from the nerves. The motions should be such as not to force the head of the bone down upon the brachial plexus. These movements should be repeated daily.

The treatment of the neuritis is to be by linear blisters two inches long and one inch wide, applied along the course of the nerve. Sometimes I use the actual cautery over the inflamed nerve. This is followed by marked relief of the pain and absorption of the thickening along the line of the nerve. Hypodermatic injections into the parts will be required if the pain is intense. Avoid morphia as much as possible. Minute doses of morphia with atropia, or atropia alone, or even water alone, may be used. The puncture itself appears to modify the sensibility of the tissues. Internally we may give iodide of potassium with sodium salicylate in moderate doses, increasing as the patient tolerates it. By this plan of treatment we hope to maintain the integrity of the joint while at the same time we treat the inflammation of the affected tissues.

Many suits for malpractice have resulted from cases like this. In the later stages the case looks so much like neglected dislocation, with the head of the bone on the lower lip of the glenoid cavity, often adherent there, with the muscles wasted, that I frequently have had to defend colleagues from suits for malpractice, based upon the charge that they have failed to recognize a dislocation of the bone. It is therefore important that we should be aware of what we might call the medical aspect of some of these joint cases; we see more of them about the shoulder than about any other part of the body. They have always been interesting to me from the combination that exists there of joint-trouble with inflammation in the sheaths of the nerves, and I have taken frequent occasion to point out that, owing to the proximity of nerve-trunks to the joints, we are apt to have neuritis and perineuritis associated with affections of the joints.

DISSEMINATED SCLEROSIS OF THE CEREBRO-SPINAL AXIS.

This young man, H. D., was admitted to the hospital December 30. He is unmarried. He had measles and mumps when a child, but has been healthy since, until the present illness began. He has taken too much beer and whiskey for his own good. His family

history throws no light upon the disease. Two and one-half years ago he had a chancre, followed by constitutional infection, causing bubo in each groin, sore throat, and a cutaneous eruption on the chest and shoulders. This is an important fact, which may have a bearing upon the diagnosis of his case.

Two years ago,—that is, six months after the constitutional infection,—while jumping from a railroad train in motion, he strained his back in the lower lumbar region, causing pain and weakness. About an hour after this accident he complained of weakness and pain between the shoulders. This pain was very severe. He also had severe pain in the forehead, and the next morning, the pain between the shoulders continuing, he began to stagger as if drunk. This happened within eighteen hours of the accident. It seems impossible to ignore the mechanical element in the production of this condition. Numbness in the legs developed on the same day as the accident. The staggering and the pain compelled him to remain in the house. In the course of a week the pain descended down the neck to the back. The staggering became worse, and he was compelled to go to bed, where he remained for three weeks. The staggering then disappeared, the pain lessened, and he was able to move about. Later, the pain became localized almost entirely in the lumbar region. With a history of pain and diffused irritation coming on so immediately after a wrench of the back, it seems impossible to ignore that wrench in the production of the disease from which he is now suffering. The fact that he has had constitutional syphilis and the fact that syphilis often affects the nervous system are not to be overlooked. We must, however, bear in mind that the nerve-lesions of syphilis are among the later manifestations; and we must also bear in mind that, although a strain might have brought on this trouble in a man with latent syphilis of the nervous system, often these symptoms follow where there has been no constitutional infection. The bearing of our decision in regard to this matter upon the treatment can readily be seen. If we thought the man had syphilitic meningitis or a gumma of the spinal cord, we should pursue an anti-syphilitic treatment. If we thought that the symptoms were the result of a mechanical injury which occurred in a man who happened to have contracted syphilis, we would ignore the specific disease largely and would treat the man from a mechanical stand-point. I want to impress upon you that even in a case of organic nervous disease, although questioning develops the fact that there has been constitutional infection,—and I am sorry to say that, although the history of syphilis is met with less commonly than formerly, close

questioning into the past history of our cases still develops the existence of venereal disease in an alarming proportion of cases,—even though you find this history, you should not fall into the error of calling every symptom occurring in a syphilitic individual syphilitic, and of at once putting him under specific treatment, as though it were impossible for a person who had syphilis to become the subject of any other disease. We have all kinds of diseases occurring in syphilitic individuals, which are not due to the specific disease. As I have already said, the syphilitic lesions of the cerebro-spinal axis are usually late, and as in this case the symptoms immediately followed the mechanical injury, we cannot ignore this in the production of the train of symptoms, although I do not pretend to say that there may not have been some latent syphilitic lesion.

We have, then, a story of pain in the neck, extending down the spine, with heaviness and tingling in the limbs, the man gradually getting better in the course of three or four weeks, and then the pain limiting itself to the lumbar region. About a month after the accident he had difficulty in swallowing, especially cold food. He never had thickness of speech or trouble with the bladder. About four weeks after the accident he noticed double vision, which was relieved partially by glasses, although weakness of the eyes remains. He now has insomnia. This is the story as he gave it to us when he was admitted on the 30th of last month.

Examination of the heart and lungs reveals nothing abnormal. The liver and the spleen are apparently normal. There is partial paralysis of the external recti muscles, and there is distinct ataxic nystagmus. When he turns the eyes from one side to the other and strains the partially-paralyzed muscles, the eyeballs pass into a state of oscillation. There is no paralysis of the eyelids. There is no marked affection of the speech. His speech is not perfectly clear, but he says it was always so. While lying in bed the patient can elevate himself without using his hands. The knee-jerk is increased on both sides, but especially so on the left. The muscles of the right leg do not appear wasted. The left calf is a little flabby. Tactile sensation in the leg does not appear to be perfect. He does not judge the distance between two points on the left leg as well as on the right. With his eyes open as he stands up, his carriage is a little uncertain; this is more marked with the eyes closed. His gait is distinctly spastic and staggering. There is marked ankle-clonus. The muscular sense in both legs is good. As I have said, his gait is uncertain and staggering, and the muscular incoördination is most

marked in the left leg. This gait is properly called an ataxic and somewhat spastic gait. There is not so much ataxia and the legs are not jerked about so violently as in a case of posterior sclerosis. The pupils are unequal in size: the left is a little larger than the right. There is commencing atrophy of both optic nerves, and there is contraction of the field for the appreciation of form, most marked on the right side. Color perception is good. The right light reflex is wanting. The right pupil is smaller than the left, and, as I have mentioned, there is paresis of the external recti muscles. We have decided evidences, then, of trouble with the optic nerve. Examination of the urine shows the specific gravity to be 1010, and on one or two occasions—not constantly—we have found traces of albumin, but no sugar and no tube-casts. His temperature has been disposed to be a little above normal. Once or twice it has touched 100° , but usually the evening maximum has been about 99.2° to 99.4° ,—sometimes 99.6° .

I shall not to-day take time to speak minutely in regard to the terms knee-jerk, ankle-clonus, etc., but shall speak rather of the larger features of the case, and those on which we shall base our treatment. Having developed the fact that the man has had syphilis and has met with a severe accident, and having called attention to the symptoms which he has presented, I shall ask your attention while we proceed to determine whether there are or are not evidences of direct mechanical injury to the spinal column. In dealing with cases of nervous disease there is one question you often have to ask yourself,—that is, whether there is or is not evidence that the patient is assuming or exaggerating the symptoms. In your examination, particularly of chronic hospital cases, this thought must always be in your mind until you have eliminated it by a careful diagnosis of the case. As the patient stands before us, his station is very fair. In almost every person there is a certain amount of swaying. We look at this carefully, for it belongs to certain groups of nervous disease to have this ataxia of station. The amount of variation in the station can be ascertained accurately by having the shadow of the patient projected upon a screen, or by the patient standing before a screen marked with vertical lines, and the observer watching to see the amount of swaying measured by these spaces. Sometimes this becomes very considerable. Returning to our case, the spinal column appears to be straight, and there is no lateral curvature. The finger passed over the spinous processes notes nothing unusual. The seventh cervical vertebra is quite prominent, but that is so often the case that we cannot speak of it as abnormal. We test the flexibility of the spinal column by having the

man bend forward and backward, and we find that the flexibility of the spine is good. There is no undue rigidity of any part. Very little pain is experienced, and that is felt across the small of the back when the extension or flexion is extreme. The determination of these points is of extreme importance in the diagnosis of this case. I cannot urge too strongly upon you the importance of careful inspection of the spinal axis. I have myself been overwhelmed with shame not a few times in my life, after treating patients for weeks for incipient paralysis, by having my attention called accidentally to the necessity of examining the spinal column, and finding one of the spinous processes prominent, with evidences of disease of the bones of the column. This man rotates his body from side to side, twisting his spinal column, with considerable ease and without pain, and there is no pain on pressure at any part of the spine.

What sort of injury could have happened to the spine from a wrench causing within twelve hours the symptoms which have been mentioned? Of course the man might have had a partial dislocation of one of the vertebræ, but then we should have had some demonstrable evidence of it. On the other hand, there might have been a violent strain affecting the muscles and the fibrous tissue without involving the bone. This, I think we must conclude, was the condition in this case. But why, after this comparatively simple injury, should the man for two years have this train of symptoms of irritation of the spinal cord? Let us look at the other side of the question. Suppose that this man, having had syphilis two and one-half years ago, was two years ago developing syphilis of the nervous system,—that form of affection which is called sclerosis, and of which syphilis is one of the common causes. It causes a gray degeneration of the nervous tissue, commencing first in a slight irritation, which leads to swelling of the connective tissue between the nerve-filaments, and later to contraction. The nerve-filaments then atrophy, and their place is taken by this morbid connective tissue. We recognize the presence of sclerosis by its peculiar gray color, and thus arises the term gray degeneration. Sometimes this affection will attack one column and run up to the brain. Sometimes it will attack spots here and there. Sometimes it is limited to one column of the cord, as in posterior sclerosis. It may be isolated, constituting insular or disseminated sclerosis, involving then not only the spinal column but also the brain. In insular sclerosis we find a diffused and vague picture, because the disease does not do enough harm in any one part of the brain or spinal cord to destroy entirely its function; but it teases and weakens every part of the spinal column

and the various parts of the brain, so that we have a great number of symptoms mixed up together. Suppose that two years ago syphilis attacked this man's cerebro-spinal axis, producing insular sclerosis, would that explain the symptoms now present? I am sorry to say that it would explain them very well indeed. In the first place, we should find in insular sclerosis, as a consequence of the affection of all the four columns of the cord, disturbances of motion from affection of the anterior column and disorders of sensation from involvement of the posterior column. These symptoms would not be uniform, as in transverse myelitis, causing interference with motion and sensation from that point downward. In insular sclerosis we should find more degeneration in the anterior column, say, of one side than of the other, and in one posterior column more than in the posterior column of the other side. Motion in one leg would be more affected than in the other, while sensation would also be affected differently in the two legs. In this case we find that the sensation of the left leg is not so good as that of the right. He cannot measure distances as well as on the right side. Then, when he wills to move the muscles of the left leg the impulse reaches one of the islets of degeneration and has, as it were, to make a curve, and the result is that coördination is interfered with. The man orders the leg to move and some of the muscles do not move properly, and the result is a clumsy, awkward gait. This causes uncertainty in walking, to a certain extent, but nothing like so great as where the columns are affected all the way through. In insular sclerosis there are incoördination, some instability of station and some ataxic gait, and some disturbances of sensation, and a peculiarity of the disease is its liability to involve the cerebral centres. We find that as one of these little spots develops there will be cerebral excitement and headache, and there will be evidences of disease in the optic tract. There may be ataxic symptoms, as shown by nystagmus and in the action of the pupil. In this patient there were early symptoms connected with the eye. He also noticed difficulty in swallowing. This case, then, from an early period has shown symptoms that were exceedingly diffused, and this has worried us much in trying to explain the disease on the basis of mechanical injury alone. The injury was not a grave one. We find no apparent evidences of injury, and yet for two years we have had evidences of diffused irritation, and the presence of advanced atrophy shows this tendency to gray degeneration of the nervous tissue. You will find in sclerosis, where the anterior and lateral columns are chiefly affected, that the reflexes are preserved and often increased. When the sclerosis affects the posterior column, constituting what is called progressive locomotor

ataxia, or Duchenne's disease, the reflexes are diminished, as the reflex loop, from the point irritated, through the nerve, to the spinal centre and out through the motor filament, is defective at the spinal centre. In this case, on the right side the knee-jerk is not marked, but on the left side it is very distinct, the muscles of the thigh being thrown into distinct contraction, and when the foot is dropped to the floor the muscles of the leg are thrown into a clonic condition.

I regret that we have been unable to find any evidences of injury of the spinal column. If we had we should have more hope of giving him relief. The atrophy of the optic nerve is a very unpromising fact in the case. It is certainly a strange feature that the symptoms should have developed within twelve hours after the accident. But whether or not you think there was already incipient disease of the spinal cord from constitutional syphilis, and that the shock and strain started it into activity, there seems to be no escape from the diagnosis that this man has diffused irritation of the cerebro-spinal axis, probably of the nature of disseminated sclerosis, and this probability is greatly increased by the fact of grave degeneration of the optic nerves.

I remember well a case occurring a few years ago, in which I was asked to decide the amount of damages to be paid a young woman by the Pennsylvania Railroad. She was walking on the platform of a station and stepped on a trap-door on the platform which was not properly secured. The door gave way with her weight, and she fell into a cellar a few feet deep. It was so shallow that when standing up her shoulders projected above the platform. As she went down she struck the left shin-bone and caused an abrasion which was described at the trial as a trifling abrasion. I fancy that it was something more than this, as there was a distinct scar. She went home and took to her bed. She said that her legs were numb and she could not move them, and that there were drawing pains in the back and in the legs. A physician was called, who said that it was a wrench and nervous shock. Some of the neighbors said that she was making a great deal more of it than was necessary. The young man to whom she was engaged to be married thought that it was time for her to get over such fooling. About this time the neighbors began to suspect that the doctor and the patient were conspiring to defraud the company, and talks about a suit for damages began to be heard. Some said that she had always been a girl who put on airs and thought herself better than other people. After this it was found that she could not see well. She began to have distinct stiffness in the hands. She was finally brought to Philadelphia and I saw her in consultation. The legs were not wasted the reflexes

were all increased, and the girl certainly had an hysterical look. I said to the physician, "Let us have the eye-ground examined." An expert was called, who found distinct and progressive atrophy of both optic nerves. Upon this, with the manifest increase of reflexes, and the pain, with the fact that a young person in comfortable circumstances rarely deliberately imitates a disease for months, we concluded that it was altogether probable that this was a real case of ascending sclerosis. The court awarded a large sum of damages, and the girl died of cerebral sclerosis six months afterwards. This matter of ophthalmoscopic examination and the detection of changes in the eye-ground is of enormous importance in the study of all diseases, and there is nothing that illustrates the advantage of medical ophthalmoscopy better than cases of this kind. The fact that this young man has atrophy of the optic nerves cannot be got away from.

The evidence, therefore, is in favor of this being a case of disseminated sclerosis, and I suspect that, although the coincidence of the accident is suggestive, the trouble goes back further, and that the cerebro-spinal axis had become involved to some extent from the previous constitutional infection. This affects our treatment. The case is an important one, and we shall keep the young man under observation and bring him before you again in a few weeks.

A CASE OF EMPYEMA WHICH OPENED EX- TERNALLY IN THE SEVENTH RIGHT INTERCOSTAL SPACE.

CLINICAL LECTURE DELIVERED AT ST. BARTHOLOMEW'S HOSPITAL, LONDON.

BY SIR DYCE DUCKWORTH, M.D., LL.D.,

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GENTLEMEN,—I am going to describe to you to-day a case which came into the hospital on December 1,—that of a woman who was admitted because she had a swelling upon the right side of her chest, in the forepart of the thorax. We noticed that she was badly nourished and evidently in poor circumstances. The facts in her history were very few in number. She had had a cough for many years, had occasionally spat blood during the last three years, but had been decidedly worse for the last three weeks. Upon examining the chest we found a swelling in the right lateral region, evidently fluctuating. There was very little doubt that there was matter in it. This covered the seventh rib, and was exceedingly painful. Now, such a case as this must fall naturally into one of two categories: the swelling must either be connected with some disorder of the chest-wall, or be the result of some mischief within the cavity of the thorax. It would appear at first sight a very simple matter to determine, but in point of fact it is not always so easy as it seems. Under the impression that there was fluid in the pleura which was pointing through the walls of the chest, we proceeded to examine still further in order to find evidence of this. In all cases of pleural effusion or suspected pleural effusion it is a cardinal rule to ascertain where the heart's impulse is, where the apex-beat of the heart is. That, indeed, is one of the most delicate signs you can get of effusion into the cavity of the chest. If there is effusion into the left pleural cavity, the heart will be pushed over to the right by the fluid; but if, on the other hand, you get effusion into the right pleural cavity, the heart will be pushed over to the left by the pressure of the fluid: so that a displaced apex becomes important evidence of effusion within one or other of the pleuræ. We found on making an examination in

the present instance that the apex-beat was from one to one and a half inches inside the nipple-line. That was natural enough. Therefore there was no indication that she had the heart displaced. On examining the right side of the chest we found dulness extending from the fourth rib downward into the hepatic dulness. The right back was dull all over, from apex to base. On the left side the resonance was perfectly good and natural, back and front. Now, this dulness on the right side was evidence, so far as it went, of effusion into the right pleura; but when we came to examine the breath-sounds, we found that they were impaired in front and behind. The breath-sounds could be feebly heard all over the right side, somewhat harsh, and occasionally distant crepitation was heard after coughing. Vocal vibration was absent on the right side. That was the whole of the case. A very concise history, and yet it showed that this woman had been delicate, having had cough for many years, and having spat blood occasionally during three years. It was quite sufficient to justify a suspicion of tubercular disease. We could not get rid of that idea, of course, especially as the sounds—the morbid sounds—heard at the right apex posteriorly supported the idea of tuberculosis. Proceeding still further, to ascertain whether there was effusion of fluid on that side in the pleura, we tried what sometimes has been described as Baccelli's test. Signor Baccelli is a very distinguished physician in Rome,—one of the greatest representatives at the present day of the school of medicine in that city. Now, some years ago, Signor Baccelli thought he could tell if an effusion in the chest consisted of matter or of simple serum. He declared that if you made the patient whisper, the whispering voice, when heard at the back, would be very slightly detected if the fluid consisted of pus; but if the effusion was of a serous nature, it would be well heard. Unfortunately, Baccelli's sign is not of very wide application. It has been tried and in some cases has been attended with success, but in other cases, I am sorry to say, it has been found wanting. In the present case I do not think we decided anything very definitely in this manner. The whispering voice was not particularly well heard. The test, I am afraid, is already a good deal discredited, and is not to be depended upon. Possibly, before the days of the hypodermic syringe it might have been more useful. The hypodermic syringe can nowadays be readily resorted to in these cases. In fact, I am inclined to say that now there is almost too great a tendency to plunge in the hypodermic syringe in any case of presumed pleural effusion, and so save the trouble of going through other forms of examination. Investigation by the needle should not be the first method

of procedure, but the last. There is no further appeal after you have put in the needle. Before you use it, however, you had better have exercised your clinical acumen. It should be, as I say, resorted to only after all other methods to discover the truth have failed. In this case the difficulties remained. There was another test we could apply, and that was to see if the swelling under the right mamma—the soft elastic swelling—had any impulse when the patient coughed. That is a sign of some consequence, because if there be simply an abscess one is not likely to get any impulse in the swelling, whereas if there is fluid in the pleura you will expect to get an impulse when the patient coughs. In this case we got a little impulse,—not much, but still a little. So far as that went, it was a sign of fluid in the pleura as against a simple abscess. We put her on good diet and gave her some quinine. She had been in very poor circumstances and badly fed before she came to us, and very quickly responded to good food and quinine,—got fatter day after day, and seemed to get stronger rapidly. In the next place, I call your attention to the temperature. On her admission her temperature was subnormal (98.2° to 98.4° F.), and after she came into the hospital it went down to 97° F., rising again to 98° F., but generally keeping subnormal. It remained so for about ten days, and has never been above the normal point. That at once should attract your attention. It is certainly a strange thing to meet with a case in which there is an effusion in the chest with a subnormal temperature. After a few days I asked Mr. Marsh to see the case with me. He would not decide whether there was fluid in the pleura or not, or whether it was a simple abscess of the chest-wall. He was quite ready to open the swelling, and that would decide the matter. And so, with every precaution in the way of antiseptics and so forth, the swelling was punctured. Mr. Marsh made the requisite incision, and very soon a quantity of pus gushed out,—a much larger quantity than the swelling itself contained. The nature of the case was now quite clear. The incision had opened into an empyema of considerable magnitude,—so large, in fact, that upon Mr. Marsh's inserting his finger he was able to pass it into the cavity of the right pleura. So this turned out to be an effusion of pus in the pleura of a feebly-nourished woman, which had opened spontaneously under the seventh rib on the right side.

The first thing I have to say in regard to the case is, that it is not common for empyema to open spontaneously, and it is a less common occurrence now than it used to be, for the reason that nowadays the hypodermic syringe makes the diagnosis certain and the pus is soon withdrawn. If proper treatment is carried out the case gets well.

Empyema, in my experience, most frequently points in the second or third intercostal space. The late Mr. John Marshall found it most common at a certain point in the chest in the fifth space. It is not too much to say that the whole subject of the treatment of empyema is quite a triumph of medicine. Even in my student days empyema was looked upon as a much more serious matter than it is now. Of course it is not, and never will be, an unimportant disease. My recollection—going back thirty years—is, that in those days the greater number of cases of empyema died ; but now I think I may say that the majority of cases recover. This improvement is very satisfactory. In those days it was a very delicate question to determine whether pus or serum was in the chest at all. You will hardly believe it that it is within my own recollection that a most careful clinical lecture was given in this hospital by the late Dr. George Burrows (afterwards Sir George) on this subject on one occasion when he had two cases of effusion in the pleura. He gave a most accurate and minute description of each case, setting forth all the particulars in the two instances, and arriving at the conclusion that in the one case pus would be found to exist, and in the other case serum, giving his reasons in each case. These reasons were, that in the case of the patient in which he predicted that pus would be found to exist, hectic fever prevailed (there were no clinical thermometers in those days), and the patient was subject to febrile attacks in the evenings, looked very sallow and pale, seemed very ill and generally pulled down ; whereas in the case in which he predicted that there would be found a simple effusion of serum, the patient did not look very ill, and did not have this hectic attack every day. Having made this out, he said, "Now, gentlemen, Mr. Paget shall come and open the two chests and clear up the matter." Mr. Paget (as he was in those days) was sent for and undertook the operation. Without any preparation of the surface, such as we would employ to-day, he boldly thrust a trocar into the chest supposed to contain pus. Nothing but serum escaped. He then turned his attention to the second case, and repeated the puncture. This case was diagnosed as a serous effusion, you will remember. Again the diagnosis was at fault, as nothing but pus escaped on allowing the contents to drain off. This uncertainty in the diagnosis shows what the state of knowledge on this subject was thirty years ago. But such a mistake might happen to-day, and I would be unwarrantably bold if I were to declare that by the physical signs alone, or even by the temperature, it would be possible in cases of this sort always to determine accurately beforehand what would result when the swelling was opened.

You may have a strong suspicion, and may be able to make a shrewd guess on the subject, but you would be wiser if you would not speak positively in regard to the contents. Fools, as you know, will frequently step in where wiser men fear to tread. In cases of this sort it would be certainly wiser for you to say that you are certain that fluid is present, but that you really cannot determine by the clinical signs whether it is pus or serum. You may get this hectic fever, this sweating, etc., with serous effusion just as with pus. Here, for instance, is a case in which there has been no fever whatever,—a suppurative pleurisy with no febrile symptoms whatever. You may ask whether there is any means of telling why in the one case the effusion should be purulent and in another serous. There is no way. In some cases the effusion is purulent in its primary stage and contains pus from the beginning. Sometimes the case appears to be simply one of pneumonia. At other times the effusion is at first serous and becomes purulent afterwards. That we know by repeated tapplings. So that the different stages may be described as follows: first, serum; second, a mixture of serum and pus; third, all pus. The latter stage is more apt to occur if there be any septic element in the case. Well, now, the difficulties in this instance were numerous. We could not be certain, for several reasons. In the first place, the history of the case might have pointed to tubercular consolidation, and in such a subject it would not be uncommon or unlikely to find some caseating tubercular disease of the bone, which would break down and form an abscess; so that the patient might have tuberculosis of the lungs, disease of the bone, tubercular disease of the rib running into abscess, without any communication with the pleura. Then I would remind you that the heart was not displaced by the fluid in the right pleura. I said at first that this was a very delicate sign of a certain measure of effusion. Of course if the heart is fixed by old adhesions,—adhesion of the pericardium to the chest-wall, that is to say,—it is possible that it may be so far immovable that it will not be displaced by the fluid. It requires a certain amount of fluid to push the heart over; one can hardly say how much,—whether the pleura one-quarter full or one-fifth full might be requisite to do this; but directly the effusion reaches one-third or anything above that, you are sure to have considerable displacement, provided, of course, that the heart is movable. The pus is more apt to form in some cases than in others, especially in the case of children who have effusion after scarlet fever or after measles. In this case, after opening the chest-wall, pus came out so freely that it was not thought desirable to remove any portion of the rib, as is now usually done in these cases. Surgeons lay

great stress nowadays in such cases upon taking away a portion of the rib in order to provide the requisite outlet. Unless an opening large enough and free enough is made, the wound is apt to heal, but the fluid will re-collect, and the case will not get well. Having secured free drainage, I believe it to be a good rule never to wash out the pleura. I think it is generally held now by most surgeons that if drainage is free there is no necessity to wash out the pleura. I have seen bad results come from doing this. There are risks attendant upon the injection of fluids, and if drainage be free there can be no object in such a practice. But suppose, on opening the chest, that the pus is found to be offensive; that is quite another matter, because in this case you will have a pleural abscess, and free drainage will not be enough to keep everything sweet, and in such a case washing out the pleura may certainly have to be considered. You may use a weak solution of iodine and water, which ought to have a good effect, or perhaps a solution of quinine alone, about a grain to the ounce. But you must remember that it is desirable to avoid washing out, if possible. In all these cases the treatment should be that adapted to a low state of health in which pus has been freely produced. Therefore quinine is the prime remedy; afterwards quinine and iron. Some stimulants may also be given in such cases,—malt liquors if they can be taken, good stout, porter, or bitter ale, or, if these are not liked, port wine. In cases of this sort I am quite sure that it is of the highest importance to remove the patient into the country, away from the atmosphere of a large town, or to the sea-side, with as little delay as possible.

One of the best cases that ever came under my observation, and one in which the recovery was most rapid, was that of a youth who suffered from a very large empyema following pneumonia. It was emptied (a portion of the rib being excised for this purpose), a drainage-tube put in, and the patient was sent within forty-eight hours, with a nurse and a good supply of antiseptics, down to Margate, where he lived in a room with a good view, breathing sea-air morning, noon, and night, and, as I say, in a very short time made a most rapid and complete recovery. This result I attribute in a very large measure to the influence of the perfectly pure air which he breathed. It is quite certain that in cases of this kind it is, in the first place, essential that the patient should be removed to a pure and healthy atmosphere, away from the tainted atmosphere, burdened with the dust, *débris*, and noxious materials of every sort to be found in the neighborhood of a large town. So long as the patient remains in an atmosphere of this kind pus will certainly continue to be formed, and the patient will be kept

in a low state of health which will prevent recovery. Immediately a patient is removed, however, to a pure atmosphere, his troubles will generally vanish and recovery will be rapid. Nowadays there can be no risk involved in the removal of the patient in this way. In these days of invalid carriages, of hammocks swung in guards' vans, of blankets and antiseptics, no ill effects can possibly arise from this cause. Therefore I find great fault, in this connection, with many of our convalescent hospitals and homes, founded by generous persons with the object of benefiting such cases, the rules of which seem to be most ingeniously contrived to prevent the recovery of the very patients who are most calculated to receive benefit from these institutions. They will not, in many instances, take a case in which a patient is suffering from a suppurating wound; yet these are the very patients who require, more than all others, to be sent away from London and have the benefit of sea-air and a healthy atmosphere, and who therefore, more than all others, would derive benefit from these hospitals.

In these days of patient and clever nurses it is ridiculous to suppose that a patient cannot have a certain amount of purulent discharge dressed in a cleanly and efficient fashion. The point is, that under such circumstances these discharges would not last long. As it is, in consequence of these absurd printed rules and regulations, patients are compelled to stay in an unhealthy and impure atmosphere, and they go on from bad to worse. What happens to them? What happens to anybody who has got a long-continued suppurating discharge? The patient lingers on and goes from bad to worse, and in due course lardaceous disease of the viscera and other parts of the body sets in, and once that has set in it is the beginning of the end. No use going to the sea-side then. The mischief is practically done. Therefore I repeat that in all cases of this kind the patient should be removed as speedily as possible to the sea-side; then recovery in most cases will be rapid and certain. Therefore, what with the assistance which we derive in these cases from the use of the hypodermic needle, what with the modern practice of taking away pieces of one or two ribs so as to make a cavity large enough to let the matter out, what with the provision of free drainage in the manner which I have described, and attention to the general health of the patient, we do not look upon cases of this kind nowadays as we did formerly. This woman has gone on steadily improving; the discharge is diminishing, she takes her food well, and feeds better every day; she has not been so well fed for a long time, I may say, and there is every prospect of her getting well.

TWO CASES OF CANCER OF THE STOMACH.

CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA HOSPITAL.

BY J. H. MUSSER, M.D.,

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GENTLEMEN,—Before examining the patient whom I wish to bring before you to-day, I shall ask your attention, as a prelude, to the appearance of the specimens which I have before you. They have recently been removed from a patient who has been under my observation in the wards during the last two months, suffering from the same character of illness that this patient has.

You will observe in this stomach, at the pyloric orifice, an annular constriction with thickening of the walls, on account of which the entrance to the duodenum is almost entirely occluded; in addition, it will be seen that the stomach is over-distended or dilated and that the muscular coat is thin and the mucous membrane the seat of a chronic catarrh. I show you this specimen because from it, as from other morbid specimens, we can often deduce the symptoms which would be present in a case of this character during life, and hence the clinical picture of allied cases can be portrayed. Indeed, in this case you can from the morbid specimens almost completely read the story of the disease from beginning to end. You can easily understand from such alterations the local symptoms and physical signs of the gastric disorder, the disturbances of function, and their effects on the general system. From the obstruction of the pyloric orifice you can readily infer that the passage of food into the intestines was most seriously interfered with, and that therefore some accumulation would have naturally taken place in that viscus. This obstruction, as well as the thickened, inflamed surface, is sufficient to cause the one symptom which is most common in cancer of the stomach, namely vomiting. In addition to this, the vomiting, you can readily see from the position of the constriction, would not take place as soon as food was admitted into the

stomach, but at the time food was passing or should pass from the stomach to the duodenum,—that is, two to three hours after eating.

I have here a second specimen which shows the same changes at the pyloric orifice, and in addition extensive ulceration, which well illustrates how pain is produced. In addition to vomiting and pain, if the ulceration is marked, as in the latter case, a third symptom can readily be suspected from the morbid specimens,—that is, hemorrhage. From the appearance of the first specimen there is no indication that hemorrhage has taken place, and when I detail the clinical history to you you will find this statement correct. In the second specimen hemorrhage was a frequent symptom. Now, you can readily understand that if there should be such organic change in the stomach and such interference with the passage of food into the intestinal canal, general symptoms would arise. You can readily deduce from this specimen that emaciation must almost necessarily be present, and, further, that anæmia would become a marked symptom in the course of the disease.

Not only can the local and general symptoms be inferred from the pathological appearance of the organ, but the physical signs resulting from such extensive physical changes can be deduced. Thus the mass, as you see at the pylorus, could be readily appreciated during life, and therefore an epigastric tumor would no doubt have been present. Moreover, the obstruction at the pylorus, as is the law of obstructions in all canals through which fluids must move, would be followed by hypertrophy, and then by dilatation almost invariably. Hence we should expect to find, as we usually do find, dilatation of the stomach as shown by the physical examination during life. To review: the anatomical appearances here presented readily explain why vomiting, pain, hemorrhage, the occurrence of emaciation and profound anæmia, the occurrence likewise of constipation and the physical signs of a tumor, with consequent dilatation of the organ, are present in cases of carcinoma of the stomach.

It must not be forgotten, before relating to you the clinical history of the cases from which these specimens were removed, that carcinomatous disease takes place in other portions of the stomach: notably malignant disease may also be present at the cardiac orifice of the stomach, and it may occur in one or the other of the curvatures of that organ. If present at the cardiac orifice of the stomach, as inspection of this stomach readily shows you, symptoms somewhat different will be presented. Thus, vomiting will occur, not in one or two hours, but immediately after the taking of food. Pain, of course, as well as hemorrhage, in greater or less degree, will be present, and the influence

on nutrition will be just as marked, if not more so, as if the disease were at the pyloric orifice. Of course a tumor will be caused by the growth, but during life the physical recognition of this tumor is not manifest, on account of the position of the cardiac end of the stomach, directly underneath the diaphragm and therefore beyond the reach of physical examination.

In the greater or the lesser curvature of the stomach the symptoms would probably not be so pronounced. If there is extensive ulceration, vomiting would be a marked symptom and pain a serious and constant torment. If this secondary process has not taken place, dyspeptic symptoms alone, with failure in nutrition and the development of anæmia, with the physical signs of the disease, would be present. As I shall detail to you, when the disease is in the greater curvature the tumor is usually the most marked phenomenon of the disease, coupled with failure in health.

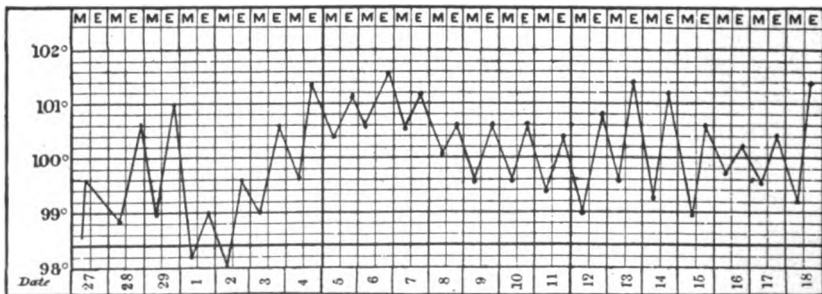
Now, to recur for a moment to the clinical history of the patient from whom the stomach first presented to you was removed. Let us see if our indication of symptoms tallies with the symptoms he presented during life. Beginning with the local symptoms,—symptoms due to the physical and functional alterations of the stomach,—first let us speak of the vomiting. In this patient it was the most distressing and, in the latter stages, most persistent symptom. At first it occurred one, two, or three hours after meals, but finally it became so constant that taking the blandest food, any movement of the patient, or an examination of him, particularly if the hand was pressed on the epigastrium, would cause emesis. It is true that the character of the vomiting changed. At first there seemed to be complete emptying of the stomach, but during the last months of his illness regurgitation, apparently of food only, took place. This would occur as the patient reposed quietly in bed, and came up from the œsophagus into the mouth in considerable quantities, but was not associated with retching or the extreme torment of actual vomiting. It seemed that the stomach was over-distended, and the discharge of food which took place was simply an overflow from that repleted viscus. Pain was marked, and was situated in the epigastrium, somewhat to the right of the median line, towards the hypochondriac region. This pain was associated with some tenderness on pressure; it was more or less persistent, but was overshadowed by pain in another locality, the cause of which I shall mention later. During the course of the patient's illness he never vomited blood. The appearance of the mass shows that this symptom was absent because there was no ulceration of the mucous membrane. Dyspeptic symptoms

antedated the vomiting, and were characterized by weight and fulness after eating, by flatulency, and by the eructation of sour fluid. I need not say that weight and fulness continued and that flatulency was present to a considerable degree when the more manifest symptoms of carcinoma developed. Constipation was extreme, and required for its relief the use of enemata. The emaciation was very great. The patient during health had weighed one hundred and seventy-five to one hundred and eighty pounds, which on admission had been reduced, although he had been only a few months ill, to one hundred and thirty-five pounds. In addition to the extreme loss of flesh, there was very marked anæmia. This was not only seen in the appearance of the patient, in the pallor of the mucous membranes and the bloodless appearance of the hands, but was also told by an examination of the blood. The red blood-corpuscles were reduced to three million four hundred thousand per cubic millimetre, and the proportion of white to red was one to three hundred; the hæmoglobin was reduced to twenty per cent.

Upon careful physical examination of the abdomen a mass was detected, not well defined, in the epigastrium, which appeared to be continuous with the liver. On percussion there was no difference in the note, and no intestinal note intervened between the liver and the tumor. While continuous with the liver dulness and situated in the location just described, it could readily be determined that it was at the apex of an enlarged area of tympany, which presumably was due to the over-distention of the stomach. The area of tympany extended from the median line to the mid-axillary line transversely, and from the fourth interspace to two and one-half inches below the costal margin on the left side. The area seemed almost circular, and the greatest diameter was transverse, twenty-two centimetres in length; the average distance was about eighteen centimetres. Of course, during the life of the patient importance was also attached to the character of the fluids discharged from the stomach, for, as you well know, some diagnostic value—indeed, recently a great deal—is attached to the chemical constituents of these fluids. This is particularly so with regard to the hydrochloric acid present in the normal stomach contents. Numbers of observers have found that in cancer of the stomach this acid is usually absent. I need not detail to you the dates or methods of the frequent examinations, but shall merely state that they were made several times. The contents were secured after a test-meal by washing out the stomach, or the vomited matter was examined. When the stomach was washed out, the fluid secured invariably showed that it was free from hydrochloric acid, both by the methyl-aniline-violet test and Gunzberg's test.

Apart from the results of the tests for the presence of hydrochloric acid, no other facts were revealed by the examinations of the fluids. The matter regurgitated consisted of the food ingested, with mucus and the secretions that occur in organic disease of the stomach.

Before exhibiting the patient who illustrates the symptoms of cancer of the stomach as seen during life, I shall speak of one or two features of this case which occurred independently of the gastric affection and yet complicated considerably the clinical manifestations of the disease. When admitted to the hospital the old man was vomiting, but at the same time he complained of severe pain at the junction of the ascending and the transverse colon. The pain was associated with tenderness and swelling at the point indicated; there was obstinate constipation and slight fever. The first thought that arose was, that while there was present malignant disease of the stomach, as shown by the symptoms which I have detailed to you, there was also probably secondary disease in the large intestine; that this was undergoing ulceration; that perforation had taken place or was about to take place, and that on account of it there was localized peritonitis. During the time the patient was under observation the more pronounced local symptoms subsided; the induration, which, as the abdomen became more scaphoid, was readily found to be continuous with the liver, persisted. In addition to local peritonitis, enormous enlargement of the liver was readily made out. The upper border in the anterior line began at the fourth rib, in the axilla at the seventh rib; the lower border extended below the margin of the ribs. The surface of the liver when the patient took a full breath seemed to be smooth, although



it was quite tender on pressure. The nature of the enlargement of the liver was a matter of speculation, and naturally we thought there was secondary malignant disease of this organ.

Along with the local symptoms there was fever, as the above chart shows. This was thought to be corroborative evidence that ulcera-

tion of the presumed malignant mass in the large intestine was taking place. As I have intimated, the local symptoms subsided; but the fever continued in a moderate degree. The symptoms due to the pyloric obstruction became more aggravated, and death took place, as is usual in these cases, from simple exhaustion.

Now, at the autopsy, as the specimens before you show, we found an unexpected condition of affairs, and one which shows that, in addition to malignant disease of the stomach, another morbid process was in progress. The large intestine was intimately adherent to the abdominal wall, and because of softening by the post-mortem changes it was torn away from the wall when the abdomen was opened. By tearing away the large intestine, adherent also to the liver, vent was given to an accumulation of pus which, on pressing above, was seen to be confined between the liver and the diaphragm. The bowel torn off could not be examined with sufficient care to determine that there was present an ulceration or that perforation was about to take place from without inward. The remaining portion of the large intestine was not without interest. There were several points of cicatrices of ulcers which were sufficient to lead one to infer that an ulcer had also been present in the locality disintegrated by post-mortem change, and that on account of this ulceration perforation had probably taken place at some period in the past, and the sub-diaphragmatic abscess developed. At what date this abscess first formed it was impossible to say; it apparently was recent, and probably was due to ulceration of the bowel.

A word further regarding the abscess. It extended backward and the pus-accumulation extended underneath the diaphragm to the crus and then passed over to the left of the median line. Here the pus was found, not underneath the diaphragm, but beneath the peritoneum which covers the surface of the diaphragm, infiltrating the muscular substance. It burrowed in such close apposition to the pleura as to cause on the upper or pulmonary surface of the diaphragm a localized inflammation which in turn was in apposition with the pericardium, and as a result acute pericarditis, as you see by this remarkable specimen, was set up.

I have intimated that facts in the patient's previous history shed some light on the morbid processes found after death. A few years prior to admission the patient had received an injury to the abdomen, on account of which he suffered from pain and at the same time had intestinal hemorrhages. Relationship of the injury and the lesion as cause and effect cannot be proved. A few facts more of negative value. The habits of the man had been bad. He was accustomed to

drink pretty constantly, and on every Saturday and Sunday he was intoxicated. He worked hard and was exposed to all kinds of weather. He never had proper care, and lived on improper food, taken in an improper way. He was seventy years of age. He had no previous illness which would bear at all on the development of the present disease, and had no family history of inherited disease.

To review, then: we may say that a man of seventy during life presented such phenomena as led us to believe that he had cancer of the stomach and secondary disease of the liver and large intestine, the focus in that area being surrounded by inflammation.

Beyond peradventure the patient had carcinoma of the stomach.

The autopsy disclosed that, in addition to the malignant disease of the stomach, the patient had a sub-diaphragmatic abscess and acute pericarditis. The liver was normal. The conjoint occurrence of these processes is worthy of a few moments' consideration. You will recall that the usual signs of suppuration were present during life. There was fever, there were daily sweats, there was marked local pain, and such obstinate constipation, requiring three days in various efforts before it was overcome, as to indicate the presence of obstruction. After the local symptoms subsided, the fever continued in a moderate degree. I confess I thought inflammation outside of the viscera had disappeared. If I had thought an abscess was present, I should have believed it to be below the liver. I thought that the continuance of the fever was due to ulceration within the bowels, and that the enlarged liver with irregular outline below was due to secondary cancer. Hereafter, fever complicating malignant disease will be given more weight as an indication of the presence of pus, notwithstanding the fact that the accumulation cannot be determined by physical signs. It is interesting to observe the atypical febrile range due to the association of the two processes. The physical signs of enlargement of the liver should have been more carefully considered, and yet I cannot see how the sub-diaphragmatic abscess could have been determined by a physical examination, short of exploratory puncture. The area of hepatic dulness was increased above, but the hepatic curve was normal. The lower border was irregular, because continuous with the dulness of the malignant growth. Hence it was suspected to be the seat of cancer. The case teaches that such irregularity, if uncomplicated and attended with fever, should suggest an abscess. We observe that increased dulness upward, with fever, may be associated with a sub-diaphragmatic abscess.

The cause of the abscess is obscure. There was no indication that it was a sequence of the gastric disease or any disease of the biliary

passages. It is not improbable that it followed perforation of an intestinal ulcer, although the traumatism previously mentioned may have been the cause. It is to be regretted that the autopsy was performed so long after death that bacteriological study to determine the pathogenic pus-producing organism could not be made.

The occurrence of the pericarditis is of interest. The reason for its development is explained by the autopsy. It occurred in the latter days of the man's life, and was not recognized because it was not suspected and the man was too ill to be examined.

The second case is that of the old man before you, some seventy years of age, who has been exposed to hardships during life and who is accustomed to the use of alcohol. He has been a sufferer from local gastric symptoms much longer than the previous case, and we find the cardinal symptoms of malignant disease present. There is emaciation, with marked anæmia and extreme prostration. Vomiting occurs, and has been present for the past six months, more or less intermittently. Pain has racked the patient constantly; it occurs almost immediately after eating and continues from two to three hours. It is often relieved by vomiting, but such relief is not secured after every meal, for the vomiting may be in abeyance for two or three days. He has never had any hemorrhage. The bowels, I scarcely need say, are very constipated, and have been so throughout his illness.

On physical examination we find a marked tumor present. In contradistinction to the case we have just detailed, the tumor can be readily outlined, and is found in the epigastric and left hypochondriac regions, extending from the median line to the ribs, four inches in length. The lower border is an inch above the transverse umbilical line, and the mass is two inches wide. On palpation the mass is found to be very hard, painful, and but slightly movable. One gets the sensation of a very firm structure underneath the hand; it is not nodulated, although its surface seems rough. The stomach is not dilated, and apparently this mass is situated in the greater curvature and the anterior wall of the viscus. On account of its location, there has been less interference with the nutrition and general strength of the patient than would otherwise have been the case. The long duration of the lesion is explained in part in this way. Then the character of the growth has much to do with the duration of the illness. It is without doubt of the scirrhus variety, which is one of slow growth, and, as the orifices of the stomach are not involved, will not interfere, probably, for some time to come with the essential processes of life.

It is of interest to place these two cases side by side, for, as I have
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intimated, they illustrate reasons for the rapid or slow progress of cases of carcinoma of the stomach. Moreover, the symptom most marked in the one—namely, a tumor—was a negative factor in the other, and this is the cause of the difference in the location of the respective growths. It is not necessary for me to enter into further detail regarding the clinical picture of carcinoma of the stomach. You can infer from what I have said that the symptoms vary with the locality of the growth, with the exact nature of the mass, and with the secondary processes that any growth may undergo. Thus, the presence of ulceration will modify the symptoms; and then, too, the symptoms are modified by the effect of the growth on the stomach. When dilatation of that organ takes place secondarily, the symptoms are modified and become like those of dilatation of the stomach. Beyond this the course of the two cases is not different from the course of malignant cases usually. The large majority of cases of primary disease occur in males late in life, and are attended by symptoms which extend over a considerable period of time,—symptoms which were present in both of these cases in a striking degree. Hemorrhage is the only marked symptom not present in these cases.

The treatment of the cases just presented to you is worthy of remark, though curative treatment is futile. It must be directed to the relief of symptoms and to the treatment of the attendant secondary phenomena. The latter is particularly required when dilatation of the stomach takes place. The symptom of vomiting, which in the first case appeared to be due as much to dilatation as to any other cause, may be relieved by washing out the stomach. After the stomach was washed out, vomiting was relieved for several days. In case No. 1 food was taken with a considerable degree of comfort. In addition to this, such remedies must be employed as prevent fermentation of whatever food is administered or required. I need not say that the diet must be carefully selected,—food easily assimilated and that will not form a mass which cannot pass through a constricted orifice. It is often necessary to use the rectum in order to keep up nutrition. No other marked symptom complained of by the first patient required treatment. In the second patient the most marked symptom that demanded attention was pain. This may be relieved by properly-selected food; but in spite of that it has persisted, and anodynes are required. It is not only proper, but imperative, under the circumstances, to use opiates, and the use of morphine, gradually increasing the doses, has been the only means of relieving the patient.

DISORDERS OF THE STOMACH.

CLINICAL LECTURE DELIVERED AT THE BELLEVUE HOSPITAL MEDICAL COLLEGE.

BY BEVERLEY ROBINSON, M.D.,

Professor of Clinical Medicine at the Bellevue Hospital Medical College; Physician to St. Luke's and Charity Hospitals, New York.

GENTLEMEN,—This woman is thirty-six years of age, and married. She tells us that one year ago, according to the statement of her physician, she suffered from “catarrh of the stomach and intestines.” Certain ordinary articles of diet, such as meat, turnips, potatoes, and spinach, are passed from the bowel in an undigested state, and she complains of a “soreness” in the lower part of the abdomen and towards the back on the left side, increased by moving around, and associated with cardiac palpitation. Her tongue is heavily coated, she is nervous and irritable, and “trembles” without sufficient cause. She is also troubled with insomnia.

It sometimes requires weeks or months of study to make, so to speak, the equation of a case; to classify the symptoms, according to their importance, as primary and secondary. It is possible that this woman has what may be termed catarrh of the stomach and intestines; we can at least use this as a provisional diagnosis. Sleeplessness, as all of you know by experience, is not uncommonly dependent upon digestive disturbance, sometimes from over-eating or indiscretions, sometimes from worry and undue physical or mental exertion. This woman says that she is not worried about anything, and, occurring as it does with the other symptoms of dyspepsia, I presume that her insomnia is due to imperfect digestion and assimilation of food. Her nervousness is probably also due to the lowering of her general tone as a result of this mal assimilation. She came to us a week or ten days ago, and yet she already feels stronger; digestion and sleep are improved, and there is much less soreness; so that the result of our treatment, thus far, seems to indicate that our diagnosis is correct.

Now, what has been the treatment? If I had given her any of the

numerous nerve-sedatives, I should not only have been guilty of foolish and irrational treatment, but I should probably have prevented an accurate diagnosis from being made. As she lacked tone, I gave her *nux vomica* and gentian to stimulate the depraved and diseased nerves in the stomach; not in large doses, for the stomach was too irritable, but in doses of five drops of the tincture of *nux vomica*, three times a day. This was directed to be taken after food, because if administered before eating it often causes much irritation, and only aggravates the condition we are striving to relieve. As there was evidence of fermentation going on in the stomach and intestine, I gave her soda, to neutralize the acidity of the stomach and to diminish the flatulence and discomfort, and I added rhubarb, first, because it is a tonic to the alimentary canal, and, secondly, because it is a laxative. In fact, this patient was ordered the old and well-known *mistura rhei et sodii* with *nux vomica*, to be taken after meals.

Here is another case. This young man is twenty-one years of age, single, and a miller by occupation. He neither smokes nor drinks; he has not had malaria nor rheumatism. For two years past he has had almost constant pain in "the pit of the stomach," which is increased after taking food. We can eliminate cancer on account of his age and general appearance, the absence of hæmatemesis, and the fact that with cancer there is usually not much pain, except in the later stages. One would naturally suspect an ulcer of the stomach, but there has been no spitting of blood, and no pain between the shoulders, and if he had had an ulcer of the stomach for two years he should show evidences of malnutrition. His bowels are regular, and he does not bring up much wind; his tongue is not specially coated, the papillæ are not very prominent, and, in fact, there is nothing at all characteristic about the tongue. It used to be laid down as a general rule that if a patient complaining of pain in the epigastrium and having this general appearance and history could digest milk with but little discomfort, an ulcer of the stomach was the probable cause of his trouble. According to the old methods of examining these cases, palpation and percussion were chiefly relied on for making the diagnosis. Thus, if, with the patient standing, sudden pressure on the stomach elicited a splashing sound, it was considered indicative of dilatation of the stomach. Another test was to give the patient a drachm of bicarbonate of sodium in one-third of a tumbler of water, and follow this with half a drachm of tartaric acid dissolved in a little water. The carbonic acid gas generated in the stomach in this way would dilate the organ so that it could be seen, or could be more easily mapped out by palpation and percus-

sion. We get no splashing in this patient, but there is evidently pain. This man has been fed on milk for two or three weeks, and also by the rectum alone for a considerable period, but all without benefit. The stomach has also been washed out without giving him relief. I think he has gastralgia, and I accordingly suggest that he be given small doses of chloral and bromide, and the milk diet continued for the present.

According to modern methods of investigation in disorders of the stomach, this man should be given what is termed "a test-meal." Ewald, a well-recognized authority on this subject, recommends that this meal should consist of a roll and a cup of tea, best given in the morning. One hour after this meal the fluid is withdrawn from the stomach by the ordinary stomach-tube, filtered, and the filtrate examined. If it be found to contain too much hydrochloric acid,—say two or three per cent.,—we should be suspicious of the existence of an ulcer of the stomach, provided we could eliminate other causes as a source of the trouble in the case. If, in addition, we find an excess of gastric fluid, we should be suspicious, even though there had been no vomiting or flatus, that there was a certain catarrhal condition of the stomach. If, on the other hand, we found very little hydrochloric acid, or an entire absence of it, in a number of examinations, we should be suspicious of cancer. In the case before us the diagnosis seems to rest between ulcer of the stomach and gastric catarrh with an excess of gastric juices. This man first began to suffer with his stomach when he was working in tanning fluid, in which there is a certain amount of arsenic. This arsenic may be the cause of the neuralgic pains in the stomach; it is possible, but improbable, because the other workmen have not been affected in this way, and he shows none of the other symptoms of arsenical poisoning. The case is a very unusual one, and is especially instructive. I understand that two eminent physicians have made the diagnosis of ulcer of the stomach, but I do not think this is in accordance with the history and symptoms. I would advise persistence with the milk diet and the small doses of bromide and chloral, and I would suggest that mild galvanic currents be passed through the region of the stomach once or twice a day.

Our next patient is a man forty years of age, a laborer, who has been costive for many years, and who complains of headache, pain over the lumbar region posteriorly and in the epigastrium, belching up of wind, bloating of the stomach, and nausea without vomiting. He has used alcohol and tobacco freely.

These symptoms are found in the ordinary cases of fermentative

dyspepsia which we constantly meet with. He needs something to get rid of the costiveness and to stimulate the liver and at the same time aid his digestion and neutralize the fermentation. I should expect to find in his stomach a considerable quantity of gastric fluid. For this class of cases I have used with much success a pill recommended to me years ago by the late distinguished surgeon Dr. Alfred C. Post. It is made up of the following ingredients :

Podophyllin, gr. $\frac{1}{2}$;
Rhubarb,
Sodii bicarb., ss gr. i ;
Ipecac, gr. ss ;
Ol. anisi, gtt. $\frac{1}{2}$.

The first two ingredients are laxative and stimulants to the liver, the soda counteracts acidity, the ipecac excites the secretions of the intestinal canal, and the essential oil prevents griping and flatulence. One or two such pills may be taken steadily every night for a long time. In addition, this man should have five grains each of pancreatin and pepsin after each meal, and should be told to avoid too much farinaceous food, especially potatoes, rice, and fresh bread, and an excess of sweets. He should drink no beer, and but very little alcohol, and if he will stop chewing and smoking he will be a better and a wiser man within two weeks.

You will find it instructive to contrast the three cases I have shown you to-day : the first, one of gastro-intestinal catarrh ; the second, of gastralgia ; and the third, of fermentative dyspepsia.

PROGRESSIVE PERNICIOUS ANÆMIA.

CLINICAL LECTURE DELIVERED AT NECKER HOSPITAL.

BY MICHEL PETER, M.D.,

Paris, France ;

Professor of Clinical Medicine ; Physician to the Necker Hospital ; Member of the Academy of Medicine, etc., etc.

GENTLEMEN,—I wish to speak to you to day of a case which came into our wards during the Easter holidays. The patient would probably have died, as they nearly always do from this malady, but, thanks to a treatment which our *chef de clinique* instituted in my absence, and which I subsequently approved of, he improved. Pernicious anæmia is clinically shown by an exaggeration of all the usual signs of anæmia, and anatomically by a diminution not only of the number of the red blood-corpuscles, but also of the hæmatoblasts and leucocytes, while there is an alteration of the plasma itself.

This disease differs from ordinary anæmia in its method of evolution, as well as in the fever and the hemorrhages which accompany it, while the usual termination is in death. The hématies are not only diminished in number, but are also subjected to an alteration in size, form, resistance, and quantity of contained hæmoglobin. From five millions per cubic millimetre the number may fall to one million three hundred and sixty thousand, and even as low as one hundred and forty-three thousand. Their size increases so much that some of these corpuscles are called "giant," being more than double the usual diameter ; then, in place of being biconcave disks, they take the form of rackets, trumpets, etc. They have the amœboid movements, and some of them have filiform endings that give them the appearance of parasites.

As to their resistance, it is much weakened, as they allow their hæmoglobin to be dissolved out by liquids that will not affect healthy corpuscles. The hæmatoblasts are very few in number ; from the normal two hundred thousand they may be reduced to only twenty-five thousand. The leucocytes are also in smaller quantity, and they are

changed in appearance and are the seat of qualitative alteration, and are also increased in size.

So much for the blood-changes; now for the symptoms. There are functional troubles in nearly the whole body. As to the nervous system, we have vertigo owing to cerebral anæmia, insomnia, difficulty in expressing thoughts, apoplectiform attacks, temporary paralysis of the face and limbs, even convulsions. For the digestive organs, we have anorexia and distaste for meat. The food, when swallowed, is followed by dilatation of the stomach and swelling of the abdomen, with frequently some vomiting or else diarrhœa.

Nothing can be found on percussion and auscultation of the chest, but dyspnoea nearly always exists. You must look to the circulation for the principal symptoms of this disease. On the slightest effort the patient will have palpitations, and by auscultation of the heart you will get several loud cardiac *bruits de souffles*, and a considerable *bruit de diable* will be heard in the arteries of the neck. The urine is usually normal, although sometimes albumin will be found. More often a diminution of urea and an increase of uric acid is the result of this examination.

The general appearance of the patient soon becomes characteristic of the malady. The skin takes on a cadaver-like pallor, distinct from the lemon-yellow color of cancer patients and the waxy yellow of chlorosis. Sometimes they are bronze color, at others a dark jaundiced appearance will be seen. The eyelids and face are puffy, while around the ankles œdema will be found. It will seem very often as though they are really fat people; and just here I am reminded of a problem that Aristotle could not answer. He wrote, "How is it that we find in besieged cities, where the inhabitants have suffered for a long time from famine, people that have become very white but fat?" The reason they were fat was because they most likely had fatty degeneration by infiltration, and they were white from anæmia.

But to return to our pernicious anæmia. We have also petechial hemorrhages and ecchymosis, mostly of the lower limbs, while from the mucous membranes we observe sometimes buccal or gingival hemorrhages, epistaxis, hæmatemesis, and melæna. In addition, then, to ordinary anæmia, there is a sanguineous dyscrasia and, if you will allow me to coin a word, "*cachæmia*,"—that is to say, bad blood, for everything in it is changed, from the corpuscles to the plasma itself. This alteration of the plasma explains why such patients get fever. At first they are apyretic, but later the temperature rises to 38.5°, to 39.5°, even to 40° C. (102° to 104° F.). You will ask why, with the

blood so scanty, they have fever. It is because of a spontaneous toxæmia that occurs constantly in such cases.

The pathological anatomy of this disease permits an explanation of some of the symptoms. The loud cardiac murmurs, which exist without any valvular lesions, are due to an alteration of the myocardium and the blood. The heart-muscle itself becomes soft and friable, passing into fatty degeneration.

The anorexia is owing to the same cause, for the mucous membrane of the stomach will be found smooth, owing to its atrophy and fatty degeneration of its glands. This is followed either by an increased secretion of hydrochloric acid in the stomach, or by a total absence of acid in that viscus, with anorexia, dyspepsia, or diarrhœa. The etiology of this affection is very interesting, as it is a malady of the entire organism, for the anæmia is but a symptom. It is frequently caused by repeated, rapid child-bearing, too long lactation, insufficient alimentation, excessive labor, sorrow, etc. This explains why we see it more in women than in men, and so frequently (in France) among "unmarried mothers" (*filles-mères*), who have all these troubles. With them there is an insufficient income and excessive output of vital energy. They fall into a state of "physiological misery" after having been in a similar social one. They have "made bad blood," according to a trite popular saying, and, as this class of people is unfortunately numerous in France, they form the majority of our anæmic patients. There is a similar form of anæmia, however, often seen in men in certain poor districts of Prussia, Switzerland, Norway, and Sweden.

Our present patient is a man, thirty years of age, who is a hostler. In 1878, he says, he had a profuse epistaxis, for which his nasal fossæ were tamponed. Later he had hæmaturia, but shortly afterwards he seems to have been in fair health, and continued so up to March, 1892, when he got so weak that he had to give up his work about the stables. On April 9 he came to this hospital, when the following symptoms were noted. His face was extremely pale, like that of a person who has had a severe hemorrhage; his lips and conjunctivæ were without blood. He was not thin, being, indeed, quite puffy. When questioned he answered with great difficulty, not seeming to understand what was said to him. This apathy was no doubt due to cerebral anæmia. The teeth and inside of the mouth were full of a thick mucus, while the tongue was white and trembling; no appetite, great thirst at night, and abundant diarrhœa, with swelling of the abdomen. The heart was normal as to size, but loud murmurs were heard at the base on a level

with the second intercostal interspace. The mitral orifice gave a murmur of a blubbery quality, which covered the whole of the first sound, and a slight murmur was heard about the tricuspid level. The jugulars presented a true venous pulsation, and auscultation here gave the double *souffle* of the neck called *bruit de diable*. The radial pulse was soft, compressible, and dicrotic, with 120 pulsations to the minute. The chest did not present anything in the way of physical signs, but the patient complained of being "out of breath" on the slightest exertion. The temperature was 103° F. The dynamometer gave a reading of 35 on both sides.

Treatment.—The patient was put on milk diet and arsenic,—three quarts of the first and nine drops of Fowler's solution per day. On the 14th of April he was very little better, and the diarrhœa persisted. Kephir No. 3 was then ordered. (These preparations contain milk fermented by diastase.) The No. 3 kephir has the property of producing constipation, whilst No. 1 produces looseness of the bowels, and the No. 2 is indifferent. He took four bottles of the No. 3 per day (about two quarts in all), and twenty drops of Fowler's solution were now given by hypodermic injections (care being taken to change the usual melissa solution in this to one of cherry-laurel water). All this was well supported by the patient. It is very remarkable what a tolerance the organism has for drugs in certain cases, which justifies the following proposition :

"The tolerance for medicines is proportional to the need of the system for them, and this lessens or disappears just as the organism improves."

After a few days of this treatment a wonderful amelioration was seen. The diarrhœa first of all diminished, then ceased. The pulse got stronger and fell to 88. The pallor of the face gradually improved and he got a little color in his cheeks, while the appetite came back and he asked for food. On April 18, besides this treatment, he was given an egg and a mutton cutlet. Little by little he was able to sit up part of the day. On the 21st the hypodermics were given up and replaced by ten to twelve drops of the Fowler's solution given by the mouth. The temperature fell to normal, he soon slept well, ate fairly, and all the symptoms left him except the heart-murmurs, which were now very slight.

On the 13th of April the number of the red corpuscles was only 660,300, in place of 5,000,000, while the white ones were 5890. A considerable number of giant cells were seen, and but few hæmatoblasts. Many of the red corpuscles had a nucleus in them. On May 3 an-

other examination gave red corpuscles 1,736,000, white 4960 ; still a number of giant globules, but the nucleus had left the red ones. On May 31 we found 3,069,000 red corpuscles and 4960 white ones, so that the first had increased enormously in six weeks. The general state of this patient to-day is satisfactory : pulse 76 ; good appetite ; normal temperature ; dynamometric strength = 45 in place of 35 as at first.

So that this case, which seemed doomed to certain death in a short time, is cured, or at least saved, for it is probable that he will be weak for some time yet ; and this is all owing to the effect of arsenic and diastased milk or kephir. In closing, I may add that iron is powerless in this form of anæmia.

THE SYMPTOMS OF POISONING BY CARBONIC OXIDE GAS.

CLINICAL LECTURE DELIVERED AT THE HÔPITAL DE LA CHARITÉ.

BY P. BROUARDEL, M.D.,

Professor of Medical Jurisprudence and Dean of the Faculty of Medicine, Paris.

BEFORE entering into the subject of poisoning by the fumes of charcoal, I wish to call your attention to some important facts that have been well studied by Gréhant and other modern physiologists. Claude Bernard showed that when an animal was put into an atmosphere containing carbonic oxide, this gas fixed itself upon the blood, and formed with its hæmoglobin a combination that is much more stable than oxy-hæmoglobin, and that this action prevented the exercise of the so-called respiratory function of the corpuscles. This is not all. M. Gréhant then made a long series of experiments, the results of which explain why the greater number of these cases are seen in medico-legal practice. He demonstrated especially that death can take place in an atmosphere that is very slightly charged with this poisonous gas, owing to the fact that a person or animal placed within its influence would absorb the carbonic oxide contained in the air, and allow it to accumulate in the system; that is to say, at every fresh flow of blood into the lungs a portion of this gas would be taken up, and this would go on until the accumulation of carbonic oxide in the blood should be sufficient to prevent hæmatosis. This action takes place more or less rapidly according to the proportion of carbonic oxide in the atmosphere, but it will cause death no matter whether that proportion be one to two hundred or one to two thousand. In other words, we cannot fix the toxic dose, because the problem has two sides: one, the proportion of gas in the air, and the other, the duration of the exposure to it. In order to impress this well upon the memory, let me mention the fact that every winter we are called upon to make autopsies on beggars who are found dead on the lime-kilns outside of Paris. These poor creatures endeavor to get warm on the ovens, and fall asleep

there, but, notwithstanding that they are constantly in the open air, the smallest fissure in the kilns allows the escape of enough carbonic oxide to cause their death.

Let us now study the symptoms. We may eliminate at once cases poisoned by an atmosphere that is saturated with carbonic oxide gas, as we do not meet them in actual practice. The physiologists tell us that an animal exposed to such an atmosphere dies rapidly in violent convulsions, so that it is probable that a man would do the same; but, as we have stated, we are never called upon to treat such cases.

The type we have most frequently to deal with is among a class of people who use a small stove, either for heating or for cooking, one or both, and generally in a space more or less cramped. A large number of people may be thus affected at once although the stove may give off but a very small quantity of carbonic oxide gas. At first a person exposed to such an atmosphere feels a *painful constriction about the temples*, then *cephalgia* follows. These two symptoms are so well known by chemists, and others who are accustomed to work with the gas, that they take the precaution of going at once into the fresh air when they recognize these premonitory signs of poisoning. If this be not done, *vertigo* is soon felt, and it is accompanied by optical illusions and sometimes by hallucinations. This is followed by an irresistible inclination to sleep. During this first stage of the poisoning by carbonic oxide the individual retains his senses and the power of motion, so that he can still escape from the danger that threatens him, if he only make the effort in time. Exposed to the same influences, the second stage, or that of the loss of muscular power, soon develops. In this stage the person affected may realize his danger and yet be unable to save himself. This condition is very well illustrated by an experience of one of the professors of the Faculty of Medicine, who almost lost his life a few years ago. While working one evening in his room, finding that it was becoming oppressively hot, he rolled the stove into another room (many French stoves are on wheels). Soon after returning to his work he began to experience headache and vertigo. When he tried to get up he found that he could hardly move. However, realizing his danger immediately, he made a violent effort and reached the window, but had not the strength to open it. Nevertheless he managed to break a pane of glass and alarmed the inmates of the house, who hastened to his rescue, and his life was saved.

Boutmy gives two examples of this kind in his works: one of a lady who survived, and the other of an engineer who died in two days after the poisoning, although every effort was made to restore him.

There are other cases of this nature that are very striking. During the great fire at the Opéra Comique, in Paris, two years ago, when the firemen were able to enter the bar-room they found twenty-seven people all in a heap, who had died together, and none of them were burned: their clothes, hair, etc., were all in good condition. Some few had gloves on that were slightly cracked by the heat, showing that the temperature was never more than 110° to 120° C. (230° to 248° F.). They presented all the appearances of death from carbonic oxide gas, as was shown by the medico-legal inquest that was held; and they were no doubt arrested in their flight by the muscular impotency that we have spoken of. It is during this period that some authors have observed *convulsions*, but they must be rare. What is more frequent is *vomiting*, when the person has dined beforehand. Devergie and the older writers attached a great deal of importance to the *relaxation of the sphincters*, and this sign led to considerable discussion in former times, because before the spectroscopic reaction of the blood was studied the diagnosis of asphyxia by charcoal fumes was based on this weakness of the sphincters. *Shivering* has also been given as a symptom. During the last few years this question has been more thoroughly investigated by scientific experiments, and we do not place so much faith on the symptom of *pain*. Delle, who committed suicide with charcoal fumes and wrote his impressions every five minutes, spoke a great deal of his sufferings, but it is more than probable that they were mental rather than real, as persons who have been recalled to life after carbonic oxide poisoning do not speak of much pain. The predominating symptoms are the constriction of the temples and the cephalalgia. The proof that they do not suffer much is the fact that they always persist in their design, which is not the case in many painful methods of suicide. It would be quite easy to collect some thousands of cases of carbonic oxide poisoning, accidental or voluntary, where the persons have died without making a single movement. Most of those who are poisoned during sleep die without waking or making any attempt to ward off the danger. This second period of muscular failure lasts for a variable time, the person falls into a state of *coma*, in which he may finally succumb. Even at this period an energetic intervention by artificial respiration, inhalation of oxygen, etc., continued with patience for a long time, will recall such patients to life. But the task does not end when the patient breathes again. It is important to watch the breathing, and assist it, if necessary, until the poison is eliminated. Within the last few years medico-legal students have been very much occupied in investigating the excessive discharge of urea which

occurs at this moment in such cases, and the glycosuria that follows it. The other interesting complications are those of the nervous system,—first the persistent headache, which is very painful, and next paralysis. This last is generally partial, of the face or arm, and occasionally a hemiplegia. Dr. Landouzy and myself had a case of this kind lately. A woman had been brought to the Charity Hospital in profound *coma*, and the next day had a facial and brachial paralysis. There was a thrombus just where the facial artery passes over the inferior maxilla, and a blood-tumor as large as an egg in the axilla. This paralysis lasted two months, and was followed by a number of hysterical symptoms that were difficult to separate from those of hysteria and the carbonic oxide poisoning that she had been subjected to. In any case we can state that these forms of paralysis are peripheral in nature.

Let us now pass on to the study of some new troubles that have been investigated by Barthélemy, Magnan, Gaucher, and Bréant, and have been placed on record in communications they have lately made to the Société de Médecine Légale.

Barthélemy reported a case of an alcoholic who had attempted suicide with charcoal fumes and was brought to Dr. Fournier's ward in the St.-Louis Hospital, where he was treated with eight hypodermic injections of ether daily. After having been in *coma* for seventy hours he came to, but the next day he completely lost his memory; he could not tell his age, name, or where he lived. He remained in this condition for two months, and was finally sent to the Vincennes Insane Asylum. A similar case in a woman was also reported by this observer. Briand has published a similar one, and we ourselves once examined a Paris physician who, after having been poisoned by carbonic oxide gas emanating from the stove of a neighbor, seemed to recover, and brought suit against the proprietor of the house for damages. He then fell into a state of amnesia, and could not carry on his practice. He would forget the name of his patient, and could not write a prescription. This lasted for some eighteen months, and then he finally recovered his usual intelligence.

From these collected cases it would seem that *mental troubles* must be especially guarded against in this malady. The most striking characteristic of this partial dementia is the *amnesia* of which we have spoken: this is either partial or total. These symptoms are similar to those seen in patients after great railway accidents, such as we have met with recently in the Charenton disaster. But they are not like the symptoms of general paralysis, and we do not think it is necessary to make a differential diagnosis between them.

Having now rapidly outlined the symptoms of poisoning by carbonic oxide gas, we must not close this lecture without speaking of the *slower* forms of this trouble. Dr. Lancereaux has shown that a prolonged stay in a room that is heated by a stove may give rise to certain symptoms. It is understood that the stove in question is well arranged, and does not give off more than the minimum amount of the toxic gas, a quantity in fact that cannot be measured and is usually given off from the best stoves. Lancereaux made his observations in rich families who raised their children in hot nurseries, where the heat was kept up by stoves, and he found that these children had gastrointestinal troubles that were apparently due to the carbonic oxide in the air.

The old-fashioned way of building houses by employing heavy wooden joists has been happily replaced nowadays by the use of iron supports. These old beams were subjected in time to a curious transformation by which they were rendered as soft as punk and burned as easily, giving off an immense amount of carbonic oxide gas. Some of them have taken fire close to a chimney and burned on slowly for a long time without attracting attention. This slow combustion is very dangerous. Professor Broca noticed one day that the floor of his study, in an old house, seemed to be very hot. He sent for the fire-brigade men, who could not discover anything. Broca was not satisfied, and with a large gimlet bored a hole in the hottest place of the flooring, and found, with a thermometer, that the heat was intense. Going deeper, he got sparks of fire, showing that the old heavy joist was undergoing slow combustion. This has occurred a number of times, and the people living in the house have presented symptoms of *head-ache*, *vertigo*, and a *loss of strength* that led the doctors astray, until fortunately a fire broke out and showed that the real cause of the trouble was carbonic oxide poisoning. Finally, there are the so-called "professional" cases of poisoning by this gas occurring in certain trades in which the gas is employed, but we do not think that it is the only factor in such cases. It is also asserted that the so-called "cook's anæmia," which is so common in Paris, depends on this etiological factor; but there are very complex conditions in this well-known anæmia. Certainly, being constantly over the hot furnaces, which are kept so heated that they allow of the cast-iron lids passing some carbonic oxide gas into the air, is a bad thing, but it must also be admitted that kitchens have other causes for anæmia, such as bad smells from vegetable matter. A temperature of 35° to 40° C. (95° to 104° F.), together with draughts of air, combined with the fact that

cooks take a good deal of alcoholic drinks, produces a complex condition of things that need not be put down to the account of carbonic oxide gas alone. As to the "miner's anæmia" described by Halle, Fabre, and Commentry, here also we must not consider carbonic oxide too much in the etiology of this malady, for there are other vitiated airs in tunnels and mines, and an important matter is the absence of sunlight. Bourru has also blamed carbonic oxide gas for the maladies which are seen in foundries (among those who work in iron and copper), prominent among which are obscure forms of neuralgia. Allow me to say in conclusion that while the possible presence of carbonic oxide gas in all such cases may be admitted, yet we do not believe that it is the only factor to be considered.

DIAGNOSIS OF CARCINOMA OF THE PYLORUS.

CLINICAL LECTURE DELIVERED AT THE GENERAL HOSPITAL, BIRMINGHAM.

BY ROBERT SAUNDBY, M.D., F.R.C.P.,

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GENTLEMEN,—The case which forms the basis for my lecture to-day is one which many of you saw during his life in Ward 21, and some of you may have thought over the questions presented by it and the revelations of the post-mortem examination.

The following is an abstract of the notes of the case :

Thomas P., aged fifty-two, farm laborer, was admitted to the hospital on June 13, 1892, complaining of vomiting, which had occurred daily for the last six or seven months.

Family History.—His father died of old age and his mother of dropsy ; six brothers and sisters are alive and well ; one brother died from some unknown cause.

General Surroundings at Home and at Work.—The patient was not married ; he had a comfortable home and always plenty of food ; his habits were temperate ; his work was hard field labor.

Previous History.—He had never had any serious illness nor met with any accident. An inguinal hernia had existed for more than twenty years.

History of Present Illness.—His sickness began with vomiting and epigastric pain ; on one or two occasions he had vomited what he thought was blood mixed with food. These attacks came on generally one to one and a half hours after eating.

State on Admission.—He was a well-developed man ; body a good deal wasted ; weight nine stones two pounds. His conjunctivæ were slightly yellow and skin sallow ; expression of face anxious. No œdema. Temperature, 99° ; pulse, 60 ; respirations, 18.

Digestive System.—He had lost almost all his teeth, and his tongue

was flabby, slightly furred, and red at the tip; his mouth was rather dry; deglutition normal; appetite bad; some thirst at times; but there was no nausea or desire to vomit except when the stomach was full. After eating he had pain, which was relieved by vomiting. The vomited matter was brown and frothy, giving the reaction of blood with tincture of guaiacum and ozonic ether, and showing the presence of free hydrochloric acid by Gunzberg's test.¹ Under the microscope it contained sarcinæ and the remains of food, but no blood-corpuscles. The bowels were confined, the epigastric and hypochondriac regions were prominent and tympanitic, and on passing a tube into and distending the stomach with air by means of a spray apparatus, as suggested by Professor Ewald, it was seen to reach below the umbilicus and to extend well into the right hypochondrium; but no tumor could be felt, although there was some tenderness complained of at first on palpating the pyloric region. He was given a test breakfast consisting of a slice of bread and three-quarters of a pint of weak tea, and an hour afterwards the stomach-contents were withdrawn and examined. The fluid was dark-colored, containing very little solid matter, no blood, sarcinæ, or lactic acid; free hydrochloric acid was present, albumoses were abundant; it digested egg albumen perfectly, proving that both pepsin and hydrochloric acid were present in normal amounts. This method of examination was repeated on June 26, with exactly the same results.

Circulatory and Respiratory Systems.—The pulse was 60, rather small and persistent; the heart was of normal size and the sounds pure; the breath-sounds were harsh.

Urinary System.—Urine alkaline, 1024; no blood, albumen, or sugar; it deposited amorphous phosphates.

On July 3 the test breakfast was repeated, and on this occasion *no free hydrochloric acid was found.*

No vomiting occurred from the first day after admission until the 25th, when he threw up twenty-five ounces; he vomited again a little on the 27th, 28th, and 29th, copiously on the 30th and July 1, and for the last time on the 4th. His bowels were generally very obstinate and

¹ The formula for which is—

2 grammes phloroglucin;
1 gramme vanillin;
30 grammes alcohol.

Put one or two drops in a porcelain capsule with the same quantity of stomach-contents, and warm gently over a lamp, so that the fluid slowly evaporates, when, if free hydrochloric acid is present, bright red patches or streaks appear.

required enemata to move them, ordinary saline mixtures being ineffectual. He lost weight steadily while in the hospital, in spite of his ability to take a fair amount of food,—minced meat, custard-pudding, bread, and one pint of milk daily. He was not allowed any other liquid. Yet his weight, which was nine stones two pounds on admission, had fallen to eight stones five pounds on the 29th.

The treatment pursued was washing out the stomach by means of the tube and the administration of salicylate of bismuth as a stomach antiseptic. When these failed it was proposed to open the abdomen and perform gastro-enterostomy or pylorotomy, but the patient refused his consent, and died on July 8.

At the autopsy the stomach was found to be greatly dilated, measuring along the greater curvature twenty-eight inches and along the smaller curvature seven inches; greatest breadth, eight inches. On opening it the mucous membrane was slate-colored and thickened, but not ulcerated. The pyloric orifice was narrowed by an annular mass of very hard carcinoma, so as to admit the little finger with difficulty; its inner surface was ulcerated. The pylorus was slightly adherent to the surrounding parts, and there were one or two enlarged glands in the portal fissure, but there were no secondary growths in the liver or elsewhere, and the other organs were practically normal. Under the microscope the growth presented all the characters of an ordinary infiltrating scirrhus carcinoma, with much dense fibrous stroma.

The appearance presented by the stomach in the post-mortem room showed that it would have been an excellent case for operative interference had this been undertaken when the patient first came under my care, and the answer to the question, why this means was not suggested earlier, is the pith and purpose of this lecture. Of course the simple reason was that we were not sure that he had cancer, and this leads us to consider what are the elements needed for the diagnosis of pyloric cancer and how far they were forthcoming in this case.

The classical symptoms of carcinoma of the pylorus are,—1, a tumor in the required situation; 2, persistent vomiting, especially of the so-called "coffee-grounds" material; 3, pain; 4, wasting; 5, the cancerous cachexia. The first of these is by far the most important, as we shall see. The *tumor* is usually situated in the epigastrium to the right of the middle line, but this rule is not without many exceptions, as the stomach may be greatly dilated and the pylorus displaced into the right hypochondrium and even below the level of the umbilicus; it is also usually thought that the tumor does not move with the respiratory movements of the diaphragm, but this is not invariably true; it

may have become adherent to the liver when it moves with that organ, but there are cases on record in which no such union existed to account for movement which nevertheless was observed.

Therefore the presence of a tumor, whether movable with respiration or not, is a great factor in diagnosis; but we must exclude fecal masses, enlarged gall-bladder, aneurism, cancer of the omentum or pancreas, and non-malignant stomach-tumors.

Fecal masses may sometimes be moulded by the fingers, and are not painful to palpate; after a thorough evacuation of the bowels they disappear, and they can only be confounded with stomach-cancer when associated with other gastric symptoms, which we try to differentiate from those due to cancer of the pylorus.

An enlarged gall-bladder is usually elastic, but may be of stony hardness; it is movable with respiration, globular in shape, and is not in itself a cause of gastric symptoms. An aneurism is distinguished by its vertical and lateral pulsation; a cancerous growth may transmit the pulsations of the aorta, but only in a vertical direction, unless the tumor grows round the aorta, where differentiation may be impossible. Cancer of the omentum or the head of the pancreas may give rise to most of the signs of a pyloric tumor, but if the stomach is distended with air, as already described, its relation to the tumor may sometimes be accurately defined. Non-malignant thickenings of the pylorus, and encapsuled foreign bodies, such as tumors formed of hair which has been swallowed, can only be differentiated from cancer by prolonged observation and a consideration of all the other elements of the case.

The discovery of a tumor, important as it is, by no means establishes the diagnosis; but in this case there was no tumor to be felt, even when the stomach was inflated; therefore this element of diagnosis was wanting.

Persistent or rather daily *vomiting* was certainly present before admission, but this was explained by the dilatation of the stomach. The patient stated that he had no feeling of nausea or desire to vomit until his stomach was full, and treatment checked this symptom for the first fortnight after admission. The existence of hæmatemesis was not absolutely certain. The patient believed that he had vomited blood, but we could not rely completely on his statement; the matter vomited soon after admission gave the blood reaction, but it contained no visible blood-corpuscles, was not like "coffee-grounds," and no blood was ever present in the contents or the washings of the stomach. The guaiacum reaction of stomach-contents is certainly not a proof of hæmorrhage into its cavity, unless we can be certain that no food containing

blood coloring matter—*e.g.*, meat (or fibrin?)—has been recently swallowed. On the other hand, the occurrence of coffee-grounds vomit is not a proof of cancer, though it is highly suggestive of it, as the large amount of blood poured out in simple ulcer and other conditions productive of hæmatemesis is usually sufficient to excite vomiting before it is so altered as to have acquired this appearance.

Pain after eating was complained of, but under treatment this symptom disappeared; there was at first a little tenderness on palpating the pyloric region, but after a day or two he assured us that he felt none, although the region in question was explored very frequently in our efforts to determine the presence of a tumor. *Wasting* was very pronounced.

The *cancerous cachexia* is unfortunately by no means a well-defined condition; it is a peculiar sallowness of the skin due to the anæmia which is part of the constitutional results of advanced malignant disease; but it may be safely asserted that there is nothing so characteristic about it as to afford a basis for diagnosis, and that it is absent in cases of undoubted cancer and has often been recognized erroneously in cases which got quite well. Our patient was rather sallow and his conjunctivæ were slightly yellow, but these changes and the wasting were sufficiently accounted for by his dilated stomach and chronic gastro-duodenal catarrh, which had for a long time interfered with his proper nutrition.

The classical symptoms are clearly not a satisfactory basis for diagnosis, and hence Kussmaul and his followers have endeavored to establish other data by examining the stomach-contents. As the result of a large series of observations, it is maintained that in most cases of carcinoma of the stomach, in chronic gastritis, atrophy, and some neuroses there is no free hydrochloric acid. On the other hand, in ulcer of the stomach and some neuroses this acid is present in excess. It is admitted that the result in cancer depends upon the associated chronic gastritis and not on the presence of the growth, so that it has rather a negative than a positive value, and the most that can be said is that when free hydrochloric acid is present the probability is that there is no cancer. But such probabilities are eminently unsatisfactory in the diagnosis of individual cases; for, as in this case, free hydrochloric acid may be present until a few days before death. The *microscopical examination of the stomach-washings* is another method recently employed in the hope that it may sometimes reveal fragments of cancerous tissue, but it was tried in this case with only a negative result.

Instead of discussing this case further, I should like to relate to you

the details of one which has been more recently in the wards, and in which the difficulties of diagnosis are illustrated from another aspect. In the first case I was afraid to diagnose cancer, though I believed it was there; in the second, I was more sure of it, as the facts all favored the diagnosis; but I was wrong.

Emma C., aged fifty-four, widow, was admitted into the General Hospital on December 6, complaining of constant pain and frequent vomiting of the stomach-contents mixed with blood, and extreme emaciation. Her family history showed some tendency to tuberculosis, but none to cancer. Her social condition had been for long one of great poverty, and since her illness had rendered her unable to keep herself, she had been dependent upon a daughter who was equally poor. Her previous health was good, but she had borne ten children and had three miscarriages, in association with which she had had, on each occasion, what she called "inflammation of the bowels." Her present illness began two years ago as a bilious attack, and she had never been well since, though better at times. Vomiting occurred from the first several times a day; the vomited material "looked dark and took the edge off her teeth."

On admission she was very emaciated, but presented no jaundice or œdema. Her teeth were nearly all gone; her tongue was clean; she was very thirsty, but had no appetite. She was free from pain on milk diet, but she vomited many times a day. The vomited material had the typical "coffee-grounds" appearance, and under the microscope blood-corpuscles were seen, but no sarcinæ or cancer elements. The abdomen was retracted and so flat that the sacral promontory could be easily felt, and even the edges of the lumbar vertebræ. There was an ill-defined tender mass lying to the right of the umbilicus, which moved slightly on respiration and more distinctly on coughing. When the stomach was distended with air it formed a prominence in the left hypochondrium and reached below the umbilicus, but did not appear to be much dilated. She was given a test breakfast and the contents removed and examined, with the result that there was no free hydrochloric acid and failure to digest albumen. The heart and lungs were normal. She had some cystitis, but we need not refer to that further. The vomiting persisted in spite of treatment, and towards the end became fecal. She died on December 15, nine days after admission. The mass referred to above, which was at first very visible, became less distinct, and could never be defined. At the autopsy we found the pylorus adherent to the under surface of the liver, and a cicatrix about one and a half inches in length uniting the stomach to the head of the

pancreas ; there was no tumor and no sign of carcinoma anywhere ; no stenosis of the pylorus. The supposed tumor was a mass of omentum and empty small intestine, lying to the right of the stomach and upon the head of the pancreas, which probably, from her profound emaciation, projected a little. The disappearance of the "mass" was due to the entrance of a little air into these coils. The explanation of the case evidently was ulcer of the stomach, with localized peritonitis, and binding down of the pylorus so as to cause persistent reflex vomiting and probably some mechanical obstruction to the exit of food. Here we had a doubtful tumor, persistent vomiting, coffee-grounds vomit, pain, extreme wasting, and no free hydrochloric acid. After the preceding case it would certainly appear that there was enough to justify the diagnosis of cancer.

In order to place before you still more clearly the points of resemblance of these two cases, I would direct your attention to the following table of their symptoms :

SYMPTOMS.	CANCER.	ULCER.
	Case I.	Case II.
Age	Fifty-two.	Fifty-four.
Duration	Six months.	Two years.
Wasting	Great.	Extreme.
Jaundice	Slight.	None.
Edema	None.	None.
Pain	Slight.	Severe.
Tongue	Slightly furred.	Clean.
Tumor	None.	Ill defined.
Vomiting	Persistent, but relieved by treatment.	Persistent.
Hæmatemesis	Slight.	Frequent coffee-grounds.
Free HCl	Persistent until twelve days before death.	Absent.
Constipation	Obstinate.	Obstinate.

On considering this table, the first difference that we meet with is in the duration of the disease ; but although the average duration of cancer of the stomach is less than two years, it may extend even beyond that time. Jaundice is a frequent accompaniment of cancer, but its absence is not uncommon, while it is of course present in many non-cancerous stomach-troubles. The wasting and pain were more marked in the non-cancerous case, though present in both. A very foul tongue is met with frequently in cancer of the stomach, but here it was only slightly furred. It may be admitted that a clean tongue is against cancer, but the rule is not without exception ; Lebert even held that the

tongue in cancer is rarely foul. We may take it that no definite tumor was found in either case, but the ill-defined mass in the second helped to complete the picture of carcinoma. Vomiting was persistent in both, but more so in the non-cancerous case, while the coffee-grounds vomit, formerly held to be pathognomonic, was actually observed and well marked only in the latter. Finally, free hydrochloric acid was present in the first so long as an accurate diagnosis would have been of any practical use, and was absent completely in the second; in both the bowels were obstinately confined.

It is not too much to say that the non-cancerous case was more like cancer than the other, and that an accurate differential diagnosis is, in the present state of our knowledge, impossible. In conclusion, I wish to refer to the use of the stomach-tube in order to point out the great value of this remedy in dilatation of the stomach. I am inclined to believe that this instrument is somewhat abused in Germany and not used enough in England. Like the catheter, it is a means of treatment which should not be indiscriminately employed, but in proper cases is of the utmost value, and in no condition more useful than in dilatation of the stomach. A well-made soft tube may be introduced without pain and, after a little practice, without inconvenience to the patient, who readily learns to do it himself and to perform the daily toilet of his stomach with great ease. The object in view is to remove from the stomach the accumulated fluid, consisting of saliva, gastric mucus, and remains of ingesta, which if allowed to rest there undergoes fermentation, with resulting formation of lactic, butyric, and acetic acids, and this intensely-acid fluid sets up severe gastritis. By its removal and by simply irrigating the cavity with warm water the stomach is kept in the best possible condition for fulfilling so much of its functions as its structural defects render possible. No doubt in very advanced cases little good can be done by any means, but there are many which can be greatly assisted by the tube. It is of importance that they should be recognized in time, and for this purpose the tube is the best diagnostic means we possess, nothing being easier than to wash out the stomach and inflate it with air, when the maximum size of the organ can be readily perceived in thin people by its projection against the wall of the abdomen, and in others can be mapped out by percussion. Its value in both these directions has been illustrated by the cases I have related to you, and I hope this lecture will impress upon you, first, the difficulties of accurate diagnosis in stomach-diseases, and, second, the desirability of employing with judgment every available means of obtaining data upon which to found your opinions and your practice.

NON-RHEUMATIC ARTHRITIS AND SOME OF ITS ASSOCIATIONS.

CLINICAL LECTURE DELIVERED AT THE LONDON HOSPITAL.

BY A. ERNEST SANSOM, M.D., F.R.C.P.,

Physician to the London Hospital; Consulting Physician and Vice-President of the North-Eastern Hospital for Children, London.

GENTLEMEN,—We have lately had abundant opportunities of studying in the wards the disease which we may legitimately term rheumatism. I have asked you to regard this as a morbid process characterized usually, though not invariably, by obvious signs of pain and swelling of some of the joints,—there being an exudation from the vessels of the synovial membranes producing symptoms having a variable but not long duration,—by involvements of the endocardium, the pericardium, the pleuræ, with, sometimes, overgrowths of fibrous tissue in various scattered situations, and, exceptionally, by an acute affection of the cerebro-spinal system. The disease is observed to be accompanied at some periods of its course by a moderate fever,—unless there be such an effect upon the central nervous system as to determine hyperpyrexia,—by sweatings, sometimes by certain eruptions upon the skin, and by a notable anæmia. Though the most prominent signs may be of brief duration, or appear as the acute manifestations of a febrile disease, the process is long drawn out, the symptoms are apt to recur in outbreaks which are often improperly termed “relapses,” and, especially in relation to the structures within and around the heart, there may be induced slow morbid changes, going on for months or years.

It is to disease whose phenomena fall within this outline that I want you to restrict the term “rheumatism.” Do not apply the words “rheumatism,” “rheumatic,” or even “rheumatoid,” in the loose manner too commonly adopted, to indicate any painful affection whatever, or any disorder induced, or supposed to be induced, by a chill.

We now turn to consider some of the affections which are not rheumatic, though they might *seem* to be such.

In the majority of cases the diagnosis of rheumatism is not difficult, but do not overlook the fact that there are pitfalls into which you may stumble, and an error may mean a serious loss of reputation. In the periods of infancy and early childhood the difficulties are most likely to occur. In the growing long bones there may be inflammation of the epiphyses or the diaphyses, which may simulate rheumatism. Recollect that in the young child the arthritic manifestations of rheumatism are often very slight, or evanescent. If you find evidences of great pain and tenderness confined to one joint, do not consider these rheumatic until you have found them to be variable and fleeting, or accompanied by other of the signs of the rheumatic process. The president of our College of Surgeons (Mr. Bryant) has lately said that he has been frequently called in to see young people, supposed to be suffering from acute rheumatism, which did not yield to the ordinary remedies, whose disease was not rheumatic at all, but an *inflammation of bone*, due to special causes. Mr. Bryant urges the important rule, that when called to a case of febrile disturbance of a doubtful nature either in infants, children, or adults, but especially during the age of growth, the practitioner should carefully examine the limbs, and particularly the long bones, for swellings. A mistaken diagnosis may be very serious, for precious time may be lost before tension is relieved by incision and the extension of the disease checked. Remember, then, that a rheumatic arthritis must be differentiated from an inflammation of the bone known as epiphysitis, ostitis, osteo-myelitis, or osteo-periostitis,—diseases due to the destructive agencies of the micro-organisms which induce suppuration. Obviously these diseases have nothing to do with rheumatism.

It is possible that tubercular disease of a joint may be mistaken at the outset for rheumatism, but the chronicity of the local affection and the absence of the concomitant signs of the rheumatic process will probably solve the difficulty. In such cases, of course, the arthritis is etiologically distinct; it is due to the micro-organisms of tubercle.

In the young child *congenital syphilis* may induce an arthritis. In the adult syphilis often causes periostitis with distinctive features little likely to simulate disease of a joint, but in infancy and earliest childhood the congenital affection may have among its first manifestations inflammation of the ends of the long bones. The joint becomes fixed, swollen, and tender. The diagnosis is not likely to be difficult, for some of the signs of congenital syphilis will be discovered.

The difficulties may be very much greater in the case of *pyæmia*. Both in the adult and in the child the early signs of this disease, when it involves the joints, may closely simulate those of rheumatism. If we look back to descriptions in works published only fifteen years ago, we may read cases stated to be those of acute articular rheumatism which we should certainly now consider to be examples of pyæmic infection. For instance, in the seventh edition of Bouchut's work on "Diseases of Infants and Children," published in 1878, are described cases (page 989) said to be those of mono-articular and poly-articular rheumatism, in which the joints after death were found to be filled with purulent and sero-purulent exudations and where the conditions of septic infection were not doubtful. If the joint-pain be very severe, the temperature-chart showing unusual oscillations of high and low readings, if the effusion within the joint show no signs of variation and diminution, it is probable that the inflammation is pyæmic and not rheumatic, and the physician must be on the alert to find a focal area of suppuration whence the septic micro-organisms may have been derived. In these days we should entirely differentiate these cases from those of rheumatism.

In rare cases the arthritis of rheumatism may be simulated in the subjects of *hæmophilia* or of *scurvy*. In a lad who is a "bleeder" remember that you may be called upon to treat symptoms which are supposed to be those of acute rheumatism. There may be great pain, swelling, and tenderness of the knee, hip, elbow, ankle, wrist, or shoulder-joint,—one or more of these,—with febrile manifestations. In some cases the occurrence of purple and bruise-like discolorations of the surface may convince you that the joint-affections, like these, are also due to extravasations of blood; but at other times such signs may be absent, the arthritic phenomena may recur alone, and I have known good observers to describe these as cases of rheumatism occurring in the subjects of hæmophilia. I do not think that this is the correct interpretation. We do not find the other associations of the rheumatic process, and I consider that the arthritis is due to repeated hemorrhage in the tissues of the joint rendered vulnerable by previous occurrences of like causation. The point is important practically, for counter-irritation, as often applied near a rheumatic joint, must in these cases be employed with great discretion, and massage, if employed at all, be practised with a very gentle hand. In some cases of scurvy, pain and swelling about the joints are induced by subperiosteal hemorrhage, and in rare cases in the period of infancy and childhood—as shown by Dr. Thomas Barlow—the malady may complicate rickets.

In such, the knees, wrists, and ankles may be swollen and tender and there may be much pain on movement ; great improvement has followed the administration of suitable vegetable food, but the fatal cases have demonstrated that subperiosteal hemorrhage may be very extensive.

You must also be careful to remember that arthritis may accompany some of the *specific fevers*. In the case of scarlatina this is of common observation, and in the great majority of cases the differentiation from rheumatism is unnecessary, for scarlatinal arthritis is, from its character, from its associations with pericarditis and endocarditis, and from its other affinities, essentially rheumatic. The same may be said, in my opinion, of the phenomena which, in rare instances, follow measles. I have myself observed measles to be directly succeeded by manifestations undoubtedly rheumatic.

In certain other specific febrile and inflammatory affections, however, there is no intervention of the rheumatic state. Arthritis in exceptional cases follows typhoid fever. In such cases it is usually the hip-joint that is attacked ; but there may be involvement of the synovial membranes, the cartilages, and the ligaments of other joints. More frequently arthritis is observed in association with dysentery. In this disease it is the knee which is most frequently affected, but many articulations may suffer ; there is much pain referred to these, with tenderness on pressure, and, in some cases, abundant synovial effusion. The arthritis occurs in the mild rather than in the severe cases and in the later periods of the intestinal disease ; it has no rheumatismal associations. Mumps (parotitis) is sometimes accompanied by manifestations of arthritis, especially of the joints of the lower extremities ; in this case also there are no rheumatic associations. It may be worth while remembering that parotitis is also an occasional accompaniment of typhoid fever. We have had some examples lately, and there is a man now in the wards in whom the swelling over the parotid was incised, giving exit to pus. He also manifested arthritis of the toes, knee, and elbow, but this was distinctly gouty, and therefore he does not come into the category of cases which we are now considering. The only points I wish you to bear in mind are, that typhoid may be followed by arthritis, that parotitis may have a similar sequel, and that typhoid may be accompanied by parotitis. A much more common association of arthritis is that with gonorrhœa or urethritis. The inflammation of the joints at first closely resembles that attending rheumatism, but it is more apt to centre in a single articulation,—the knee or the elbow. There are great pain and tenderness, and oftentimes abundant effusion within the joint. The arthritis does not subside within a limited

period, as in the case of rheumatism, but persists for weeks or months, and often leaves much thickening and stiffness. It is occasionally accompanied by endocarditis, but there is strong evidence to show that this is rather of the septic than of the rheumatic form. Gonorrhœal arthritis generally begins at about two to four weeks from the commencement of the urethral discharge; it has not the associations of rheumatism, but occurring in a rheumatic subject it may lead to or complicate an attack of ordinary rheumatic arthritis.

Excluding the inflammations of joints which are the direct effects of injury from without, we may divide our cases of non-rheumatic arthritis into the following groups:

1. Cases of hæmophilia, scurvy, or purpura,—the arthritis to be ascribed to the effects of effused blood.

2. Acute inflammation of the heads of the long bones, due to the destructive effects of the micro-organisms which induce suppuration.

3. Syphilis, producing arthritis through an inflammation of the heads of the long bones only when the latter are in the early stages of growth and development.

4. Pyæmia, the agencies being the micrococci of suppuration and their toxins.

5. Certain infective diseases,—dysentery, enteric fever, mumps, gonorrhœa. In these it is most probable that the agencies are micro-organisms or their toxins. There yet remain two large groups.

6. The arthritis due to gout, which on this occasion I shall only incidentally consider.

7. The disease known under very diverse names,—chronic rheumatism of the joints, chronic rheumatic arthritis, rheumatic gout, rheumatoid arthritis, nodose rheumatism,—all these terms suggesting some affinities with rheumatism,—or other names, in which there is no reference to any affinity with rheumatism,—*e.g.*, primitive asthenic gout, osteo-arthritis, dry arthritis, and arthritis deformans. Obviously from the terminology there is some difference of opinion whether this disease is of the nature of rheumatism or of gout, or whether it is distinct from both.

I now ask you to give your attention to some cases that might be placed under this category. I shall take three examples that have been under our direct observation in the wards. I will premise that in these, at least in the earlier periods of their manifestations, the term “chronic” would be misplaced. The symptoms are *acute*. We will briefly outline the cases, and then consider the associated conditions.

The first case is that of a man, aged twenty-four, well developed

and strong, without a sign of anæmia. He had no family predisposition to rheumatism nor to gout. He stated that he had had "rheumatic gout" in the left foot three months before admission. The pain then was not referred to the ball of the great toe, there were no indications of old inflammation in this situation, and my house-physician, Dr. F. J. Johns, failed to find any trace in the patient of a gouty tendency. The man evidenced, however, a severe arthritis of the right knee. The ends of the tibia and the femur were enlarged and excessively painful; pressure greatly increased the pain; there was some fluctuation (synovial effusion) only over the inner part of the head of the tibia. During the early stage of the illness the temperature rose to a maximum of 101.5° F., but while pain was yet severe it fell to 98° F. The pulse at the early stage was 54, *but fell afterwards to 48 per minute.* This form of arthritis was mono-articular: only the knee was affected during the many weeks that the patient was under observation.

I drew your attention to the considerations that the hard, firm enlargements of the articular ends of the bones, the absence of intra-articular effusion, the protraction and the severity of the pain, and the absence of concomitant signs of rheumatism, all combined to differentiate this from an ordinary rheumatic arthritis. There was no sign of disease of the heart or pericardium, or evidence of syphilis, of gonorrhœa, or of any form of septic infection. After long treatment, especially by repeated blisterings above the joint,—the administration of salicylate of sodium and alkalies having proved wholly inefficacious,—the patient was able to leave the hospital, walking without pain, but with a thickened joint.

The second case is that of a female, aged thirty-two, who was admitted for pain and swelling of several joints, her temperature being 100.6° and her pulse 114. She came of a singularly healthy family, there being no predisposition to rheumatism or to gout. She had borne five healthy children (two of them died of bronchitis) and two still-born. There had been one miscarriage. She was now in the seventh month of pregnancy. There were no evidences of syphilis, and she said she had been perfectly healthy until this illness, which began eight days before her admission. She first noticed stiffness and pain in the left hand; the next day the knees were swollen and painful, and a few days afterwards the right wrist and elbow were attacked. After her admission, the painful symptoms left the other joints, to become concentrated in the right elbow and wrist. There was little or no fluid effusion, but great enlargement, especially of the elbow-joint, which was firm, unyielding, and excessively painful. The treatment by the in-

ternal administration of the salicylates with alkalies failed to give any relief. Six weeks after her admission the patient was delivered of a still-born child. There was a breech-presentation. Recovery from the effects of parturition was quite normal, and the course of the arthritis was unmodified. There is yet much pain and thickening of wrist and elbow, though the patient has now been more than nine weeks in hospital, but there has been improvement after repeated local blisterings.

During all this protracted arthritis the temperature has been usually normal or subnormal; on one day only it reached 102.5° F., during two periods of three weeks its maximum was 99.1°. There have been frequent perspirations; the hands are now usually hot and moist. The conditions of the heart have been perfectly normal, with the exception of a soft systolic murmur over the site of the pulmonary artery,—a murmur no doubt of neuro-cardiac causation and not indicating organic disease. The pulse-rate has varied between 96 and 120.

I call your attention to the aspect of this patient and to some peculiar spots upon the skin. Her face has a light-brownish, *café-au-lait* color, the coloration being more marked on the left side, and she is much freckled. There are no patches of staining upon her neck; on the forearms, hands, and upper arms are many peculiar, almost uniformly circular, spots, varying in size from that of a pin's head to that of the section of a hemp-seed, say from a circle of half a millimetre to one of two millimetres diameter. Some are of a light-brown, others of a dark-brown, color, the latter approaching to black. It is just as if the surface had been sprinkled by a brush dipped in pigment of sepia mingled in a lesser or greater proportion of water.

We will now turn to our third case, an out-patient who has come to us many times for examination in the wards. Her age is twenty-five, and her principal complaint is of pain in the back and about the shoulders at night; it is not noticed during the day. She stated that she was in good health until two years ago, when she had an illness characterized by pains generally over the body, pain after food, and burning sensations referred to the abdomen. Then the feet and knees began to swell and become painful, and there were variable pains about the shoulders. Soon afterwards the hands became swollen and painful. In April of this year the patient went to Bath to undergo treatment, but she says she experienced no improvement in the joints, which became stiffened.

We now note that there are thickenings of the phalangeal joints of the second, third, and fourth fingers of the right hand; thickening, but not ankylosis, of the wrist of the same side; great enlargement of the

right elbow, the arm being kept semi-flexed and resisting extension. The muscles of the forearm and upper arm are much wasted. On the left side the wrist is much stiffened, resisting passive movement, the elbow and hands scarcely affected. The skin generally seems thin; the hands are moist, and are peculiarly soft to the touch.

The patient says that when the illness commenced she suffered from palpitation of the heart. Her pulse-rate now is 116, but on a former occasion it was only 84. The sounds of the heart and all the physical evidences are to the effect that the organ is structurally quite normal; but on some occasions we have noticed a soft blowing systolic murmur at the base,—a so-called hæmic murmur.

We find on the skin a few dark sepia spots, and the face is freckled. The spots are much more sparse than those in the preceding case,—a large one is seen on the dorsum of the right hand, another (smaller) in a similar position on the left hand, and one on the pinna of the right ear,—but they are exactly like those of the other case in form and color.

We will now very briefly consider how these cases—and cases such as these—differ from true rheumatism: *first*, in the form of the arthritis; *secondly*, in the associations.

The *inflammation of the joints* in true rheumatism is usually sudden in onset and rapid in subsidence, and the pain associated with it has a close, though not constant, relation with the degree of fever. We usually observe that when the temperature of the patient approaches the normal the severity of the pain has subsided. Morbid anatomy tells us that there is hyperæmia of the synovial membranes with the effusion of a serous fluid, turbid with flakes of lymph, within the joint. The arthritis of rheumatism is essentially multiple; joints are involved successively and many at one time.

The arthritis in the cases which we have just observed does not answer to these criteria. Though other joints were attacked in the earlier manifestations of the disease, the morbid processes and the suffering (very greatly in excess of that usual in rheumatic cases and very considerably prolonged) were concentrated in the knee in one, and in the elbows in the two others. The analogy of other cases tells us that the morbid anatomy is very different from that of true rheumatism. The synovial membrane is intensely injected, and may present fringes here and there containing enlarged vessels, which may become ossified. The cartilages are enlarged, and may change to bone or may become worn away. The heads of the bones may show signs of inflammation (osteitis), and the articular ends may be greatly thickened and rendered dense like ivory (eburnation). It would seem that there is a process

of inflammation of the joint far more intense than that which obtains in rheumatism, and there is a tendency on the one hand to exuberant growth and on the other to absorption and decay. Effusion within the joint is not so constant as in rheumatic inflammation, but it may occur in considerable degree.

In all our cases marked deformity of some of the affected joints was the result, and the muscles in the neighborhood were wasted,—atrophied in a degree that does not obtain in true rheumatism. In only one of our three cases the joints of the fingers were affected in a marked degree. We shall watch the other cases for thickenings of the finger-joints and deflection of the phalanges, for these conditions are observed in a large proportion of similar cases. You will notice that in all our patients the onset and course of the arthritis were *acute*, especially in the one first mentioned. Some good observers have denied the occurrence of an acute form of such non-rheumatic arthritis and regard the instances described as having a rheumatic commencement. A consideration of the form of arthritis, as shown in our cases, and of the associations we are about to consider, will, I think, bring conviction to their minds.

What, then, are these associations? First, the *cardiac*. In these cases (and in all others of the same kind, chronic or acute, which I have observed) there has been no evidence whatever of endocarditis leading up to valvular defect,—a striking difference here to the truly rheumatic group. Yet there have been disturbances of the rhythm of the heart. The most frequent disturbance has been an abnormal acceleration of the heart's contractions,—tachycardia. Out of seventy-five of my cases of rapid heart continuous for long periods, six were in association with osteo-arthritis. Palpitations were complained of by one of our three patients in the early stages of her disease. Sir Dyce Duckworth has noted a similar association, and Dr. J. Kent Spender was, I believe, the first to call attention to the long-continued cardiac acceleration in the affection. Another association which I have observed is with irregularity of the heart's action. Out of forty-seven of my recorded cases of persistently irregular heart, six were in cases of osteo-arthritis.

Much more rarely the disturbance of the cardiac rhythm in the subjects of the disease is in the form of a slowing of the heart's action,—bradycardia. In our first case, though the temperature was 101.5° F., the rate of the heart's pulsations was only 54 per minute, and this was reduced through the course of the malady to a steady 48.

My experience confirms the opinion of many observers, that in

osteo-arthritis there is no tendency to endocarditis or pericarditis; but I am convinced that there are sometimes *mixed cases* in which a non-rheumatic arthritis may be manifested in one who has previously suffered from the changes of true rheumatism, and that an osteo-arthritis patient may become rheumatic.

Secondly, an association of non-rheumatic arthritis may be with *vaso-motor disturbances*. There may be flushing, patchy blushes of evanescent erythemata, not bordered, as is so often the case in the rheumatic variety. Intermittent sweatings, not correlative with the stage of fever as in rheumatism, occur. Especially the hands are so damp and soft and the skin of the palms so thin that you may suspect a case of osteo-arthritis from the first touch of the hand. In some cases the feet are bedewed, and in others, at times, abundant sweat may trickle down the back. Remember that these vaso-motor disturbances may recur at intervals for months and years, and are not manifested at times of feverishness or debility, as in rheumatism. I have no doubt that, like the cardiac disturbances, they have their origin in a disorder of the nervous system.

The third and last association to which I shall call your attention is that with *peculiar pigmentations of the skin*. In some cases there are brown stainings resembling those sometimes observed in pregnancy. These patches of pigmentation may be observed over the forehead, the temples, and the backs of the hands. The most peculiar of the manifestations, however, are those which I have asked you to term "Spender's spots." The stainings remind us of those in certain cases of pregnancy, in Addison's disease of the suprarenal bodies, in Graves's disease (exophthalmic goitre). The spots are peculiar, though I would not hazard the assertion that they are never met with except in cases of osteo-arthritis. Dr. J. Kent Spender (of Bath) said that the disseminated form of pigmentation called freckles was to be observed in a large proportion (about two-thirds) of all cases of the disease. It cannot be contended that it is peculiar thereto, for we meet with it in many other conditions, but the form which Dr. Spender has termed "spotty pigment" seems to me to have a close association with the non-rheumatic arthritis. I have previously described these spots in relating Case II. Dr. Spender says of them that they are mathematically round, well defined, not shading off into the neighboring skin, not raised, of blackish-yellow color, observed chiefly on the forearms, the back of the thumb, the neck, the cheeks, the forehead, and the back of the ears. It is for the future to tell us whether these will or will not serve us as useful aids to our diagnosis of non-rheumatic arthritis.

CASES ILLUSTRATING SOME OF THE VARIOUS FORMS OF MALARIA, WITH INTERESTING CLINICAL FEATURES.

CLINICAL LECTURE DELIVERED AT THE MEDICO-CHIRURGICAL COLLEGE.

BY J. M. ANDERS, M.D., Ph.D.,

Professor of Medicine, Medico-Chirurgical College; Physician to the Medico-Chirurgical and Philadelphia Hospitals.

GENTLEMEN,—CASE I.—The first case which I shall bring before you to-day gives the following history. B. E., aged twenty-eight, a native of Finland, by occupation a sailor; was admitted to the male wards of the Medico-Chirurgical Hospital on September 15, suffering from short paroxysms of fever followed by profuse sweating. His family history was found to be negative; and his own previous history up to two months ago, as well. At that time he was lying in port in the West Indies, where he suddenly developed paroxysms of the intermittent form of malaria, together with some of his mates. These paroxysms recurred daily at the outset. The chills were quite severe, and lasted one hour, the other stages being equally intense,—the whole attack lasting not more than twelve hours. At the end of four days the attacks recurred at intervals of two days, giving rise to the tertian form of intermittent fever. These attacks were attended with severe pains, particularly at the back of the neck and over the upper dorsal vertebra. These are regarded by some authorities as highly characteristic of malarial poisoning; and they have been quite frequently present in the cases observed by myself. He was treated, according to his own statement, with large doses of sulphate of quinine, with moderately beneficial results.

For about three weeks prior to the date of admission his symptoms were ill defined, the chills occurring only rarely. About six days before being admitted, he began to develop slight rigors, followed by the other stages of an ordinary intermittent. These attacks recurred for three days regularly until the day before admission, when he escaped

the paroxysm. You will recall the fact, already mentioned, that he was suffering from fever on entering the hospital, his temperature registering 102° F. He has been in the hospital about one week, during which time he has had two slight rigors, followed by fever,—the temperature rising to 103° F.,—followed by profuse sweating, the paroxysms recurring at intervals of four days. It will be seen that since the complaint began, two months ago, he has had attacks at intervals of one day, two days, and, at present, four days. In other words, he has suffered from the quotidian, the tertian, and finally the quartan type of intermittent. The quartan is rare.

His case also presents other features of decided interest. One thing in particular should be mentioned: on making a physical examination of the spleen, an organ that should be invariably examined carefully in this affection, since it is always enlarged, I found that it was increased in size in the upward as well as in the downward direction. Enlargement of the spleen can be demonstrated by palpation and percussion. Palpation is ordinarily the more satisfactory method, from the fact that the spleen is usually enlarged only in the downward direction. In the case before us, we find no difficulty in feeling the lower and anterior edges of the spleen, extending two inches below the inferior costal border. It is quite firm to the touch and slightly tender under deep pressure. When we wish to outline the spleen by percussion, we begin high up in the axillary space, while the patient is in the sitting or standing posture, preferably, and proceed downward, until we reach the so-called splenic dulness; and this, you observe, begins in this instance at the seventh rib, instead of at the ninth as normally. It may be questioned, at first sight, whether this apparent flatness on percussion is really due to splenic enlargement, and not to pleurisy with effusion. There are several physical signs which distinguish enlargement in the upper direction from moderate pleural effusion. In the first place, when the spleen is higher than normal it will also be found to extend lower than normal. Again, whilst splenic dulness begins in this instance at the seventh rib during normal respiration, when I ask the patient to take a deep inspiration, as I will now do, you observe that there is clear percussion-resonance down to the lower edge of the eighth rib,—thus showing that during forced respiratory movements the spleen can be considerably displaced in a downward direction. If this abnormal flatness had been due to a pleuritic effusion, I should not have obtained the same result, the upper line of flatness remaining unchanged, in the latter affection, during forced inspiration; on the other hand, in pleurisy, this line changes with a change in the position of the patient.

Finally, we may employ the exploring needle, which determines the presence or absence of an effusion, as a rule. It is only rarely that cases of upward enlargement of the spleen are met with; though according to my own experience we encounter it more frequently among patients suffering from malaria than when the spleen is increased in size from any other cause.

This patient, as you will observe, has marked yellowish-brown discoloration of the skin. You will also observe that the conjunctivæ are normal in appearance: hence we conclude that the abnormal color presented by the skin is not due to jaundice. It is caused by an abnormal deposition of pigment. The source of the pigment is the transformation of the hæmoglobin, as the direct effect of the action of the plasmodium malarix. You will also notice herpes on the lips in this case. This, as well as the discoloration of the skin, already mentioned, is highly characteristic of the disease. So far as we can observe, there is no disturbance of any other organ or function of the body, except perhaps the blood. There are present slight evidences of anæmia, less marked, however, than in a case which I shall show you presently.

Now, the diagnosis of ordinary forms of intermittent fever, such as are presented by the case before us, is, as a rule, not difficult,—especially when there is a clear history of exposure to a malarious district. It should be mentioned in this connection that some of the most marked cases that are met with in hospital practice come from the West Indies. This patient comes from the West Indies. In addition to the history in this instance, we have the temperature-curve, which is distinctly intermittent in type, the splenic enlargement, the yellowish-brown discoloration of the skin, and the herpes labialis; and these constitute all the characteristic evidences of a malarial intermittent. When, however, cases occur in a non-malarious district, the diagnosis should not be hastily made. It is not sufficient that there should be merely an intermittent form of fever, even with splenic enlargement, since instances of tuberculosis, septico-pyæmia, ulcerative endocarditis, and other affections present, frequently, an intermittent type of temperature-curve.

Happily, we are now enabled, through the discovery of Laveran, to discriminate between the latter affections and intermittent malarial fever, the blood of the latter always containing the pathogenic virus, or plasmodium malarix.

The resident physician, Dr. Watson, has carefully examined the blood of this case microscopically, and found crescentic bodies lying within the red blood-corpuscles, as well as moving hyaline masses of

plasmodium. The crescents were slightly pigmented. Some of the red blood-corpuscles were observed to be in various stages of disintegration. This latter condition is ascribed to the direct action of the specific micro-organism.

The prognosis, in this instance, is favorable. At the beginning of an intermittent attack, particularly if occurring in a true malarial district, you should always be somewhat guarded, since there is always a remote danger that suddenly a pernicious paroxysm, which may endanger life, may develop. These paroxysms occur, usually, after one or two or more ordinary paroxysms, and hence soon after the onset of the attack. But when, as in this instance, more than two months have elapsed since the first invasion of the disease, the danger from this cause need not any longer be considered.

Rarely do pernicious paroxysms occur after the patient has been removed from the true malarious district.

There is nothing new in the treatment employed in this patient's case.

Immediately after the blood had been examined for the plasmodium, the usual specific, quinine, was administered, to the extent of sixteen grains daily. But, as already intimated, since instituting this treatment he has had two paroxysms, though mild, at intervals of four days; hence it would be well to increase the amount of quinine from sixteen to twenty-four grains daily. Should even this latter amount prove powerless to overcome his paroxysms, I shall prescribe the sulphate of cinchonidine in doses of ten grains four times daily. In my own hands the latter remedy has been very useful in cases no longer typical, or in so-called irregular intermittents in which the paroxysms follow no definite rule as to the time of their recurrence. Arsenic may also be tried under these circumstances; but if tried it should be vigorously pushed.

CASE II.—The next patient that I bring to your attention has a history as follows. A. T., aged twenty-one; a sailor by occupation; was admitted on the same day as Case I.; was employed on the same ship, and became infected with the disease about the same time. His case has clinical features of great interest.

It should be stated that there are two other patients in the medical wards at the present time who were admitted with Cases I. and II., suffering from the same affection, though presenting nothing of unusual interest.

It might at first sight appear as though the disease under consideration were communicable from the sick to the healthy; but such, gen-

tlemen, is not the case, unless by direct inoculation with the blood of an infected person. The fact that no fewer than four persons, closely associated in their daily lives, became infected with this complaint in close succession, is explained by the circumstance that they were all exposed to an atmosphere containing the specific virus of this disease. It is ever to be recollected that in true malarial districts every inhabitant is liable to the disease.

The young man before us also had at the outset a quotidian form of intermittent, and this merged into tertian, and finally, since admission, into a type of temperature-curve that is rare indeed, and one that I have never hitherto had the opportunity of seeing. We not infrequently meet with cases of so-called double tertian intermittent, in which at intervals of two days we have a well-marked paroxysm, while on the intervening days there occurs a mild paroxysm. To-day I show you a temperature chart which shows the quartan form of intermittent, with well-marked paroxysms, and a mild though distinct paroxysm half-way between the severer ones,—thus giving us what I think should be regarded as a true double quartan. On the days that he has had the mild paroxysms the cold stage was wanting, the temperature reaching 101° F., followed by rather profuse sweating. The severe paroxysms were marked by three well-developed stages.

We find his spleen considerably enlarged, though in the downward direction only. I have noticed one thing in this case of which mention should be made,—viz., that the spleen can be easily detected by palpation in the sitting or standing posture or when lying in the dorsal decubitus, whereas if placed on his right side it is next to impossible to find it, the organ falling away from the abdominal parietes. I have not infrequently seen clinicians place their patients on their right sides with a view to assisting in the detection of the spleen by palpation, thus defeating the very object they sought to obtain.

During the marked quartan paroxysms this man has suffered from intestinal symptoms. With the onset of the chill, he complained of slight griping pains in the abdomen, attended with diarrhoea, the stools containing considerable bile. These symptoms persisted during the following day, though less marked, to recur again with the next severe paroxysm.

There is a form of pernicious intermittent, the "algid," in which the gastro-intestinal symptoms are most prominent, and are followed by a profound collapse of the system; but in these cases the temperature rarely rises above the normal, the extremities are quite cold to the feel, and the patient is often unaware of any chilly sensations. The

intestinal symptoms complained of in the case before us were not as well marked as they are in cases of the algid form of the complaint, and are sometimes associated with the paroxysm of mild forms of intermittent. Such clinical features are not to be interpreted as belonging to the algid variety of malaria. In this case, it will be recollected, the temperature mounted quite high, and there is no evidence of approaching collapse.

The skin has a slightly yellowish aspect, though not so well marked as in the former case, whilst it is also distinctly pale, with pallor of the conjunctivæ, the lips, and the tongue.

A careful blood-count has shown that the red blood-corpuscles number two millions to the cubic millimetre. In cases of marked malarial cachexia the blood-count has been found to be as low as one million; but I have never met with a case in which it was as low as in this instance where the patient had so recently contracted the disease.

The man is, however, thin in flesh, and states that he was quite feeble before becoming infected with malaria. It is not improbable, therefore, that he was suffering from anæmia prior to the onset of the malaria.

The microscopic examination of his blood revealed wide-spread destruction of the red blood-corpuscles,—a fact that readily accounts for the pronounced anæmia present. Further than this, we observed crescentic-shaped bodies, pigmented amœboid bodies, in a state of motion.

After an examination of his blood he was put on the same treatment as Case I., with equally unsatisfactory results up to the present. I shall now order increased doses of quinine, and, this failing, shall prescribe the sulphate of cinchonidine. Owing to the marked anæmia present, we will also administer the following:

R Tinct. ferri chlor., ℥x;
Liq. arsenici chlor., ℥ii;
Syr. zingib. q. s. ad ʒi.—M.
Sig.—At one dose after meals.

CASE III.—This lad, aged fourteen years, has been residing, since two years of age, in a malarious district situated in the northeastern portion of Philadelphia. From the age of two until about ten he lived in the vicinity of Gunner's Run, a little creek, along the course of which cases of malaria are numerous, though rarely taking a pernicious form. At the age of five he began with chills and fever, at first of the tertian variety. For this he was treated, but never fully

recovered, most probably for the reason that he continued to reside in the same locality. From time to time he subsequently had attacks of malarial intermittent, according to the statement of the mother.

When first seen by myself, about two years since, he had removed to another portion of the city, which is also somewhat infected with malaria. He presented at that time about the same appearance as he does now. You will notice that his skin has a jaundiced hue; the conjunctivæ show a still greater degree of yellowness; the abdomen looks prominent, so also do the superficial veins.

On making palpation, we find the spleen excessively enlarged, extending three inches below the level of the umbilicus and reaching to the median line of the abdomen. The notch on its anterior surface can be distinctly felt. It is hard, and not at all tender under pressure. Though very much enlarged in the downward direction, it is only slightly so in the upward,—splenic dulness beginning on the eighth rib.

The liver is also greatly enlarged, reaching down as far as the level of the umbilicus. Though greatly enlarged, the liver and spleen do not occasion any apparent inconvenience.

I have never observed a larger spleen than is presented by this case, considering the age of the patient. It is stated on the highest authority that the ague-cake of chronic malarial cachexia is not exceeded in dimensions in any other affection, save perhaps leukæmia. The lad has shortness of breath on the slightest exertion. This is more or less characteristic of the trouble.

The diagnosis of chronic malarial cachexia is in this instance not difficult, on account of the facts that the boy has resided so long in a malarious district and that he suffered from intermittent attacks repeatedly. The presence of the well-marked jaundice, which has lasted now about two years and a half, though not diagnostic of this condition, is sometimes observed, more particularly in the severe forms of the affection. It is to be ascribed, doubtless, to an associated catarrhal condition of the bile-ducts; and as an evidence of catarrh of these passages in this case we have the presence here of gastro-intestinal symptoms from time to time, and indeed he is rarely without slight diarrhœa. His stools showed an absence of bile, giving them a rather pale hue. In the region of the stomach and the intestines, so far as they can be palpated, there is slight tenderness.

Inherited syphilis as a cause of the condition should be thought of in connection with the question of diagnosis in this case. There is, however, absolutely no history obtainable of this disease in the family, after the most careful inquiry. Again, it is not likely that the liver

would have remained during all these years as large as it now is if enlarged on account of syphilis, but would have undergone secondary contraction. Then, too, the patient was a perfectly healthy child before the onset of the malarial symptoms.

The prognosis in cases of chronic malarial cachexia may be put down as guardedly favorable, provided that the patient is removed permanently from the malarial locality. This latter I deem of the utmost importance, and have endeavored to induce the parents of this child to make a change of residence to a place in which this class of affections is unknown. The course of the trouble, however, is exceedingly chronic, as is exemplified in the instance before us, and hence no time can be specified during which a cure may be expected.

I should mention that whilst there has been no diminution in the size of the liver or the spleen in this instance, he is less jaundiced than he was one year ago: his general condition is also greatly improved, as the result of energetic treatment.

The treatment, in the main, has been anti-malarial. Instead of the administration of quinine, however, I employed at first the sulphate of cinchonidine, together with arsenic and chinoidin. The latter, although a crude preparation, has been of the greatest service in combating chronic malarial toxæmia in my own hands. It has been administered in doses of four grains every four hours. In adults it may be given in doses of eight grains at similar intervals. At the same time, treatment has been directed to the catarrhal state of the intestinal tract, with a view to overcoming the diarrhœa and jaundice. For this purpose the phosphate of sodium has been employed in small doses, alternating with the nitrate of silver, in combination with minute doses of hyoscyamus and the extract of opium. At present he is taking, in connection with the sulphate of chinoidin, though in a separate prescription, argent. nit. gr. one-eighth, with hyoscyamus gr. one-sixth, in pill form.

BRIGHT'S DISEASE.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL
SCHOOL AND HOSPITAL.

BY WILLIAM H. PORTER, M.D.,

Professor of Clinical Medicine and Pathology in the New York Post-Graduate
Medical School and Hospital, etc.

LECTURE No. 1.

GENTLEMEN,—I desire to-day to begin the consideration of that class of diseases commonly called Bright's disease. First of all it is necessary that we should understand some of the fundamental principles of physiology. If we interpret correctly the physiological mechanism of the human organism, and, by its aid, study the manner in which these lesions called Bright's disease are produced, we are in a much better position to treat them successfully. As a result of such a study, we shall find that having Bright's disease is not, as it used to be considered, equivalent to signing one's death-warrant, but, on the contrary, it will be found that we can cure a large proportion of renal diseases. We must not, however, look upon these diseases as local, specific conditions belonging to the kidney alone, for all the lesions occurring in the kidney are secondary to physiological disturbances which have gone before, and consequently our treatment should be directed not so much to the kidney as to these prior conditions.

The all-important point in the physiology of the human mechanism is a thorough understanding of the composition of food and its exact relation to nutrition. The diet is divisible, as you see by Table I., into three groups of food elements: (1) inorganic principles, such as water and mineral salts, (2) proteid or albuminous elements, and (3) the fats, starches, and sugars. From an exhaustive study of this subject, I have come to believe that the inorganic substances all enter the body in their own form, and pass out of the system absolutely unchanged. The decompositions which appear to have occurred are upon the outside of the body, as in the alimentary and urinary tracts, and not within the deeper tissues. We have, then, to deal next with the

TABLE I.
COMPARATIVE TABLE OF FOOD-STUFFS.

Kind of Food.	Water, H ₂ O.	Proteids, or CHNOS.	Starch, Sugar and Cellulose, or CHO.	Fat, or CHO.	Mineral Salts.
Human Milk	88.28	3.41	4.62	3.48	0.21
Cow's Milk	86.28	3.73	4.98	4.60	0.60
Skimmed Milk	88.00	4.00	5.04	1.80	0.80
Buttermilk	88.00	4.10	6.40	0.70	0.80
Cream	66.00	2.70	2.80	26.70	1.80
Cheese	41.84	29.23	. .	23.84	5.09
Eggs	69.05	15.58	. .	13.96	1.41
Average Meat	65.56	17.51	. .	18.16	8.77
Fat Meat	54.22	15.99	. .	28.22	1.57
Lean Meat	74.44	19.77	. .	2.56	3.23
Average of Fish	75.57	16.98	. .	6.20	1.25
Butter	11.70	0.50	0.50	87.00	0.80
Bread	86.00	7.50	58.85	1.15	1.50
Potatoes	74.50	2.25	21.92	0.15	1.18
Lentils	12.51	24.81	58.86	1.85	2.47
Beans	11.75	24.81	58.08	2.54	8.87
Peas	14.93	28.00	57.80	1.86	2.41
Wheat Flour	12.46	14.66	67.62	1.93	3.33
Rye	18.97	14.27	66.91	2.25	2.60
Barley	18.80	12.96	67.18	2.76	3.10
Oatmeal	12.05	12.15	67.00	6.55	2.25
Corn	14.80	12.50	62.65	8.80	1.25
Millet	18.14	12.85	68.35	3.60	2.80
Rice	15.14	7.47	75.69	0.80	0.90
Green Vegetables	88.00	2.50	3.25	1.75	4.50
Arrow-Root	18.00	. .	82.00
Alcohol (?)	0.75	. .	99.25
Kumys (Brush's)	90.99	2.04	3.88	1.91	0.44
Matzoon (Dadirrian's)	87.69	3.98	2.10	4.91	0.78
Kumysgen (Beverage)	86.81	4.15	8.06	1.01	2.00
Beef Tea	95.78	3.28	. .	0.25	0.67

starches, the sugars, and the fats. They are rapidly oxidized over into carbon dioxide and water, yielding in the course of their transmutation heat and energy, or, as tabulated, heat, energy, lubrication,

TABLE II.
RESULTS OF OXIDIZING "CHO" COMPOUNDS.

Starches, sugars, and fats	yield to the body	heat, energy, and rotundity, and act as lubricat- ing agents,	and are excreted from the body as	carbon dioxide and water.
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and rotundity. Briefly stated, the starches, sugars, and fats have nothing whatever to do in the constructive work of the system, but are simply rapidly oxidized into the final products above enumerated, and

yield to the system heat, and secondarily, through heat, energy. Heat and energy, of course, are just as essential in one sense for the maintenance and growth of the individual as are the proteid elements, but they do not, and cannot, under any circumstances, enter into the construction of the body, for both inorganic and organic chemistry teach us that it is not within the function of animal life to take a CH or a CHO compound and join an element of nitrogen to it and produce thereby a proteid body; in other words, there is no chemical metamorphosis going on within the animal organism by which a proteid body can be formed, and all proteids and albuminous substances which we get into the system come to us by first being developed through the anabolic constructive action possessed by the vegetable kingdom. Nature has so constructed the lower animals, particularly the ox and other herbivora, that the digestive systems of these animals can denitrogenize and convert a vegetable proteid of higher nitrogenous composition into an animal albumin or proteid having a smaller number of nitrogen atoms to the molecule. The proteid elements, then, obtained from the vegetable kingdom are very much higher in their molecular construction, and consequently require much more digestive energy to denitrogenize them and render them available. Finally, every bit of tendon, muscle, or cellular element in the human mechanism is developed out of a proteid originally introduced as a proteid substance. We take it in albumin, usually in the form of casein, egg albumin, or in the sarcous elements of muscle, or occasionally as a little serum albumin, or as a vegetable proteid. When this proteid body enters the stomach, it is first acted upon by the hydrochloric acid and transmuted into an acid albumin, then into a series of albumoses, and finally into a diffusible peptone, in which particular form it is capable of passing through the animal membranes and gaining access to the general circulation. When it reaches the blood-stream, however, it appears in another form, having been transformed in its passage through the intestinal wall into serum albumin, serum globulin, and fibrinogen. When these substances pass to the liver, under ordinary circumstances, they are again altered and converted into still other bodies, so that they can form muscle-tissue, white fibrous tissue, yellow elastic tissue, cartilaginous tissue, and the various cell-elements of the body as indicated in Table III. Having served their purpose in this way, they pass on to the kidney, and by the action of the renal epithelium and the oxygen of the blood they are decomposed, and the next we hear of them is in the urine in the form of urea, uric acid, and creatinin. Under normal conditions, where the requisite amounts of

TABLE III.

RESULTS OF OXIDIZING "CHNOS" COMPOUNDS.

The proteids $C_{72}H_{112}N_{10}O_{22}S$	{ are developed into all forms of bodily tissue,	yielding	{ heat, energy, muscular and glandular activity,
	and are excreted from the body as	{ urea, uric acid, creatinin, car- bon dioxide, water, and sul- phuric acid	

mineral compounds, proteid matters, and of the starches, sugars, and fats, and water, are introduced, and the nutrition of the body is perfectly maintained, the final results are as follows: the urine will contain about thirty grammes of urea, seven of uric acid, fifteen of creatinin, with the various mineral salts as recorded in Table IV., which have

TABLE IV.

COMPOSITION FOR STANDARD URINE.

Water H_2O	1486 05 grammes
Urea, CH_4N_2O	35 00 "
Uric Acid, $C_5H_4N_4O_3$	2.00 "
Creatinin, $C_4H_7N_3O$	1.00 "
Calcium Phosphate, $Ca_3(PO_4)_2$40 "
Calcium Carbonate, $CaCO_3$05 "
Magnesium Phosphate, $Mg_3(PO_4)_2$	1.00 "
Sodium Chloride, $NaCl$	15.00 "
Potassium Chloride, KCl50 "
Sodium Phosphate, $Na_3(PO_4)$, $Na_2H_2PO_4$, and NaH_2PO_4	4.50 "
Potassium Phosphate, $K_3(PO_4)$	
Sodium Carbonate, Na_2CO_350 "
Potassium Carbonate, K_2CO_3	
Sodium Sulphate, Na_2SO_4	4 00 "
Potassium Sulphate, K_2SO_4	
Pigments, etc., variously estimated from trace up.	
Total solids, 78.15 grammes	
Total	1550.00 grammes.

previously been introduced with the food-stuffs, as shown in Table II. This constitutes briefly what may be considered the normal physiological phenomena of the body. The amount of work thrown upon the kidneys under these conditions is fully maintained by the

transmutation of these proteids which are introduced in the food-stuffs, and it is able to throw out these excrementitious substances enumerated without any appreciable wear and tear upon the system.

Now let me refer to one or two points in connection with the excretory function of the kidneys. Without entering into extended details, briefly stated the saline matters and the water are simply thrown out by a law of diffusion through the Malpighian tufts from the blood-vessels into the lumen of the uriniferous tubules. In most of the works on physiology we are still taught that glucose, albumin, and proteid matters of that kind are also diffused through the blood-vessels, but I take exception to that, and argue, with pretty strong proof to sustain the claim, that the albumin found in the urine in Bright's disease is in a large proportion of the cases a by-product of incomplete oxidation thrown out by the epithelial cells, and that it is not filtered through the capillary blood-vessels. With reference to the glucose, the argument is so strong that there is little room for doubt. Glucose has never been found as such in the blood, notwithstanding that it is commonly so stated in the works on physiology. Close scrutiny shows that this statement is founded on the fact that some observers have drawn the blood from the body, subjected it to a series of chemical transformations, such as boiling with sodium sulphate or alcohol, and finally obtained a glucose reaction with Fehling's test, and on this account have claimed that the glucose pre-existed in the blood. There is no doubt regarding the proteid as an antecedent of glucose in the blood, but the glucose is formed as such by the renal epithelium from the incomplete oxidation of the proteid molecule. So far as I am able to find, there is no direct and positive evidence that glucose has ever been found in the blood by applying the fermentation test direct to that blood. We do know, however, that the urine contains at times enormous quantities of glucose, and I recall one case where a man was passing from eleven to twelve thousand grains of glucose per diem. When we drew some of the blood of this patient and subjected it to the only thoroughly reliable test for glucose—the fermentation test—we could get no evidence that sugar existed in the blood drawn. We may say, therefore, that glucose is produced by the renal cells, and that it is not formed from the starches and sugars, as formerly taught, but that it is a by-product, the result of incomplete proteid oxidation, as illustrated in Table V. If a person takes an excessive quantity of starches, sugars, and proteids, instead of forming and eliminating the normal amounts of urea, uric acid, and creatinin, we find that there is a diminished quantity of urea, an

TABLE V(a).

POSSIBLE PRODUCTS OF OXIDATION OF THE PROTEIDS OR "CHNOS" COMPOUNDS.

BY PROF. W. H. PORTER.

	Oxidation.	Proteid.	Oxygen used.	Urea.	Uric Acid.	Creatinin.	Oxalic Acid.	Lactic Acid.	Glucose.	Hippuric Acid.	Carbon Diox.	Water.	Sulph. Acid.*
1. Highest			154(O) = 9(CH ₄ N ₂ O)								+ 68(CO ₂)	+ 57(H ₂ O)	+ (H ₂ SO ₄)
2. Super			151(O) = 7(CH ₄ N ₂ O) + (C ₂ H ₄ N ₂ O ₂)								+ 60(CO ₂)	+ 50(H ₂ O)	+ (H ₂ SO ₄)
3. Normal			180(O) = 4(CH ₄ N ₂ O) + (C ₂ H ₄ N ₂ O ₂) + 2(C ₂ H ₄ N ₂ O)								+ 54(CO ₂)	+ 38(H ₂ O)	+ (H ₂ SO ₄)
4. Uric Acid		C ₇ H ₁₂ N ₄	186(O) = 2(CH ₄ N ₂ O) + 2(C ₂ H ₄ N ₂ O ₂) + 2(C ₂ H ₄ N ₂ O)								+ 52(CO ₂)	+ 40(H ₂ O)	+ (H ₂ SO ₄)
5. Oxalic Acid		N ₁₆	129(O) = 2(CH ₄ N ₂ O) + 2(C ₂ H ₄ N ₂ O ₂) + 2(C ₂ H ₄ N ₂ O) + 7(C ₂ H ₄ O ₂)								+ 38(CO ₂)	+ 38(H ₂ O)	+ (H ₂ SO ₄)
6. Lactic Acid		O ₂ S	94(O) = 2(CH ₄ N ₂ O) + 2(C ₂ H ₄ N ₂ O ₂) + 2(C ₂ H ₄ N ₂ O)					+ 7(C ₂ H ₄ O ₂)			+ 31(CO ₂)	+ 19(H ₂ O)	+ (H ₂ SO ₄)
7. Diabates			76(O) = 2(CH ₄ N ₂ O) + 2(C ₂ H ₄ N ₂ O ₂) + 2(C ₂ H ₄ N ₂ O)						+ 5(C ₂ H ₄ O ₂)		+ 22(CO ₂)	+ 10(H ₂ O)	+ (H ₂ SO ₄)
8. Hippuric Acid			67(O) = 2(CH ₄ N ₂ O) + 2(C ₂ H ₄ N ₂ O ₂) + 2(C ₂ H ₄ N ₂ O)							+ 4(C ₂ H ₄ O ₂)	+ 21(CO ₂)	+ 24(H ₂ O)	+ (H ₂ SO ₄)

TABLE V(b).

OXIDATION OF THE PROTEID MOLECULE INTO THE POISONOUS LEUCOMAINS OF THE CREATININ GROUP.

BY JAMES WOOD, M.D.

	Oxidation.	Proteid.	Amount of Oxygen used.	Urea.	Uric Acid.	Creatinin.	Lactic Acid.	Ampl.-Creatinin.	Zantho-Creatinin.	Urea-Creatinin.	Carbon Diox.	Water.	Sulph. Acid.*
Ampl. Creatinin . . .		C ₇ H ₁₂ N ₄	129(O) = 2(CH ₄ N ₂ O) + (C ₂ H ₄ N ₂ O ₂) + C ₂ H ₄ N ₂ O					+ (C ₂ H ₄ N ₂ O)			+ 52(CO ₂)	+ 36(H ₂ O)	+ (H ₂ SO ₄)
Zantho-Creatinin . .		N ₁₆	122(O) = 3(CH ₄ N ₂ O) + (C ₂ H ₄ N ₂ O ₂) + C ₂ H ₄ N ₂ O + (C ₂ H ₄ N ₂ O ₂)						+ (C ₂ H ₄ N ₂ O)		+ 49(CO ₂)	+ 31(H ₂ O)	+ (H ₂ SO ₄)
Cruzo-Creatinin . . .		O ₂ S	116(O) = (CH ₄ N ₂ O) + (C ₂ H ₄ N ₂ O ₂) + C ₂ H ₄ N ₂ O + (C ₂ H ₄ N ₂ O)							+ 2(C ₂ H ₄ N ₂ O)	+ 46(CO ₂)	+ 33(H ₂ O)	+ (H ₂ SO ₄)

* Appears in urine as sulphate.

excess of uric acid, and a large quantity of glucose; in other words, the glucose comes out of the proteids, and not out of the starches and sugars.

The albumin in the urine of Bright's disease is not the result of the transudation of non-diffusible proteid substances through the blood-vessels, but is the result of incomplete oxidation of the proteid molecule, and is given off by the renal epithelium as a by-product, or derived albumin, instead of the ordinary and complete products, urea, uric acid, and creatinin, which normally represents body-oxidation.

We can, with these fundamental facts in mind, look more intelligently into the true nature of renal lesions. We find that they are simply the result of incomplete oxidation in the body and increased work thrown upon the kidney while its nutrition is imperfectly sustained. For instance, the first variety (Table VI., No. 1), which I have chosen to call acute parenchymatous metamorphosis of the kidney on account of its method of development, but which is sometimes called acute degeneration of the kidney, acute parenchymatous nephritis, etc., is not an inflammatory or primary lesion in any sense, but a secondary lesion, due to the ingestion of an excess of vegetable compounds containing an excessive amount of effete material. The most common type of this lesion is to be found in those cases which are the result of the introduction of mineral substances. We have said that these mineral compounds are not decomposed in the system. For instance, arsenic, phosphorus, mercury, zinc, copper, or antimony, when introduced into the system in abnormally large quantities, interfere at once with the normal transmutations going on in the liver and tissues throughout the body, and instead of getting urea, uric acid, and creatinin as the excrementitious products, we have an excessive amount of effete material to be eliminated as the result of a disturbed proteid metabolism, and the nutrition of the kidney rapidly becomes impaired. This is the type of kidney which you see in connection with scarlet fever, diphtheria, typhus and typhoid fever, pyæmia, septicæmia, and pneumonia,—in fact, with every infectious disease whose poison is a ptomaine, a germ, or some other toxic principle. These substances are taken up to the liver from the intestine or other seat of inoculation by the general circulation, and, as a result, the nutrition of the liver, and, secondarily, of the body in general, becomes positively impaired, and many by-products and toxic elements are produced and eliminated, causing more work to be thrown upon the kidneys, with the final development of these acute parenchymatous lesions of the renal organs. This lesion, then, is simply the result of

COMPARATIVE TABLE SHOWING CHANGES IN THE URINE WITH THE THIRTEEN DIFFERENT LESIONS.

TABLE VI.						
Bright's Disease.	CHEMICAL EXAMINATION.				MICROSCOPIC EXAMINATION.	
	Variety of Renal Lesion.	Color.	Quantity.	Specific Gravity.	Amt. of Albumin.	This refers to Blood and Casts only.
1. Acute Parenchymatous Metamorphosis of the Kidney.	Abnormally high.	Very small.	High, from 1017 to 1030.	Abundant.	Early, hyaline, epithelial, nucleated, and finely granular; small in diameter, and abundant. Later, some coarsely granular and fatty, with large diameter.	
2. Chronic Parenchymatous Metamorphosis of the Kidney.	Abnormally high.	Very small.	High, from 1015 to 1030.	Abundant.	Large hyaline, coarsely granular, and fatty casts, and large amount of cast-debris.	
3. Parenchymatous Metamorphosis of the Kidney with Pregnancy.	Variable.	Variable, but usually small.	Variable.	Variable. Trace to abundance.	All varieties of casts may be met with, even blood-casts from the renal obstruction. Early it will resemble No. 1, later No. 2.	
4. Parenchymatous Metamorphosis of the Kidney with Diabetes Mellitus.	Lemon-yellow, but later pale.	First large, then small or suppressed.	First high, 1025 to 1030; late, low; or at last lower.	At first glucose; later, trace of albumin.	None until late in the diabetes, when hyaline and fatty casts appear, occasionally a few granular.	
5. Parenchymatous Infiltration—Metamorphosis of the Kidney with wasting Diseases.	Normal or watery.	Normal.	Normal.	None.	Examination negative.	
6. Exudative.	Pale.	Normal.	Normal.	Early, none. Later, abundant, also blood.	Early, none, but an abundance of white cells. Later, casts of all kinds.	
7. Acute Diffuse Nephritis.	Abnormally high, smoky, or bloody.	Very small or suppressed.	Low, 1020 to 1012.	Abundant, also blood.	Blood and blood-casts a diagnostic feature. Early, small, hyaline, epithelial, nucleated, finely and coarsely granular, in abundance. Later, fatty and larger casts.	
8. Chronic Diffuse Nephritis—Large Kidney.	Peculiar pale.	Constantly varying: sometimes small, then large.	Low, 1017 to 1010.	Constantly varying from none to abundance.	The quantity and variety of casts are constantly varying, at times abundant, and at others absent. The constant fluctuation is diagnostic. All varieties may be found during its course.	
9. Chronic Diffuse Nephritis—Small Kidney. Hyaline Thickening of the Afferent Vessels.	Peculiar pale.	Usually large, 80 to 100 oz. a day.	Low, 1010 or lower.	Abundant and continuous.	As a rule, no casts are found; but occasionally a hyaline or fatty cast may be detected.	
10. Chronic Diffuse Nephritis—Small Kidney, without Vascular Thickening.	Peculiar pale.	Always below normal; small.	High, 1015 to 1025.	Usually abundant and continuous.	Hyaline epithelial, nucleated, finely and coarsely granular, and fatty casts, of all sizes, and in abundance, continually. Blood and blood-casts occasionally found.	
11. Interstitial Nephritis or Chronic Kidney; Cirrhosis, Sclerosis, or Fatty Atrophy; Thickening of Afferent Vessels.	Nearly like water.	Very large.	Low, 1010 to 1005.	Usually absent, occasionally a trace.		
12. Gouty Kidney.	Nearly like water.	Very large.	Low, 1010 to 1005.	Absent or a trace.		
13. Waxy, Amyloid, or Albuminoid Transformation of the Kidney.	Nearly like water.	Exceedingly large.	Low, 1005 to 1000, or lower.	Usually absent, occasionally a trace.	As a rule, no casts are found; but occasionally a hyaline cast is discovered.	

nature's effort to throw out of the system the original poison with the incomplete products of oxidation, while nutrition is impaired. These conditions continuing, the epithelial cells of the kidney become soft and granular, and the organ is very much swollen. The kidneys before you show this form of lesion very distinctly; they were taken from a child four years old, who first had diphtheria and then scarlet fever. The epithelial cells of the kidneys have become swollen, granular, and soft. These kidneys are about one-third larger than normal, much paler, and more pulpy.

This variety of lesion usually occurs with acute infectious diseases, or with the introduction of the mineral poisons, and rarely without some one of these causes. The symptoms, when associated with the infectious diseases, are usually not directly referable to the kidney, but as the kidney becomes involved the symptoms of the primary disease become more aggravated. With the mineral poisons the renal symptoms are more pronounced, however. With the infectious diseases we find at this stage that the urine is more scanty, high-colored, has a specific gravity of from 1017 to 1030, and at first contains only a little albumin. The quantity of albumin gradually increases as the degeneration and the disease advance. Microscopical examination of the urine will show first epithelial casts, then hyaline casts, then fine granular and finally coarse granular casts, all of which are generally small in size. As you are probably fully aware, casts are simply the excretion by the renal epithelium of this derived albumin from incomplete oxidation in the body, which is poured out into the lumen of the uriniferous tubules, forming a solidified cylinder of gelatinous material. If this hyaline cylinder becomes covered over with epithelial cells, it gives us what is termed an epithelial cast. If the process has been slower, this gelatin-like plug will be covered with fine granular material composed of degenerated epithelial cells, giving the fine granular cast; and if the process be still more slow, we find the coarse granular cast. If the epithelium be still more degenerated there will be, in addition, a deposit of fatty particles on the granular casts, forming what is known as a fatty cast. These casts, therefore, show you the exact stage of degeneration going on in the epithelial cells in the kidneys.

Now, in my opinion, the secret of successful treatment of these infectious diseases is to be found largely in attention to the kidneys,—not directly, but preventively; and if you carry out your treatment from the very beginning with this fact in mind, I believe much more than the usual number of cases will recover. You must prescribe a

diet composed of the animal proteid only ; in other words, a milk diet. This form of diet gives us the largest amount of nutrition, sufficient heat and energy, with the least amount of excrementitious material, and there is also a large quantity of water carried through the system, which acts therapeutically as a diuretic, and favorably influences the kidneys. I also believe that in these cases small and occasionally repeated doses of calomel have much to do with relieving the kidneys of their work. I believe that calomel is taken up by the entero-hepatic circulation, and, being a foreign body, or poison to the system, the hepatic cells eliminate the mercurial into the bile-ducts, where it is carried on through the bile-ducts into the intestines ; associated with this action there is a hypersecretion of the bile acids, and by this combined action the much-deteriorated bile is eliminated from the system. By keeping the bowels a little relaxed in this manner in these acute infectious diseases, you will find that digestion and the functions of the liver are better performed and that there is much more perfect general nutrition maintained, and that there will be less albumin and fewer casts in the urine ; the symptoms of the original disease are less active, and a larger number of cases recover.

The temperature accompanying these diseases I believe to be simply the result of this loading up of the system with the specific poison and with the increased effete material, thus preventing the normal excretion of heat. The use of the modern antipyretics, I think, is simply adding injury to injury. They are all capable of reducing the temperature, but they are all active poisons, and are consequently powerful depressants to the cerebro-spinal centres, producing, as it were, a condition of shock, and while the system is in this condition the temperature is of necessity naturally low, just as it is in other conditions of shock. I think the weight of opinion at the present time is against the free use of these coal-tar products. One authority has been frank enough to state that he believes he has killed patients with these remedies, and that by their administration the disease is prolonged and mortality increased rather than decreased. The introduction of these poisons into the hepatic organ immediately interferes with the natural function of that gland, the bile-producing activity being impeded or arrested, and, as bile is nature's great intestinal antiseptic, there is, under such circumstances, a tendency to increased fermentation in the alimentary canal, thus causing the formation of a number of by-products, which are taken into the circulation. This is an important element in causing an elevation of temperature, and especially so in typhoid fever. Among the remedies which will materially decrease this tendency to

fermentation the salicylates, I think, are the most serviceable. Three to five grains of sodium salicylate given every two hours will keep down intestinal fermentation. The salicylates have also a tendency to dilate the arterial system and flush the surface of the body and increase the heat-radiation, thereby reducing the temperature and diminishing the processes of oxidation, so that they act as very valuable and natural antipyretics. Another equally valuable remedy is ox-bile; if anything, it exceeds salicylic acid in its antipyretic action. When the liver is capable of producing the normal amount of bile, no intestinal fermentation practically occurs, and the temperature remains at a normal standard; but when we disturb the action of the liver by the introduction of organic poisons, then the production of bile is disturbed, and we have deprived nature of the chief element in the regulation of the temperature. You should give two or three grains of purified inspissated bile, three or four times a day, to get the best action. For the last four or five years, my assistants and some of my friends have, with me, adopted this line of treatment in connection with typhoid fever, and we have had some very admirable results. About fifty or sixty cases of typhoid fever altogether have been treated in this manner without a single fatal result. I do not mean to say that inspissated bile is going to save every case of typhoid fever, but I do believe the death-rate of typhoid fever, and especially among the poorer classes, can be materially reduced by the administration of this substance. The cold-bath treatment has its strong advocates, and may yield equally good results, but in private practice, and among the poorer classes, this treatment cannot be effectively used, and when not carried out in every detail it is apt to be a dangerous procedure. My associate instructor, Dr. Zeh, has treated some of the very worst cases of typhoid fever, with very high temperatures and with very severe hemorrhages from the bowels, with nothing else but inspissated bile and a little nitromuriatic acid, with a well-regulated diet and alcoholics when required, and not a single case has died. If we remember that these renal lesions are secondary conditions, the result of increased work while the nutrition of the system is defective, and we direct our treatment towards relieving this condition of the kidney by regulating the diet, digestion, and antecedent disturbances, I am sure, from my experience, that the death-rate in all these infectious diseases can be notably reduced.

The detailed treatment of the parenchymatous group of renal lesions will be taken up together after we have gone over the clinical portion of all the various forms as tabulated in my classification in Table VI.

CHLORIDE OF GOLD AND SODIUM IN THE TREATMENT OF SENILE FATTY CHANGE AND CHRONIC JOINT-AFFECTIONS.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

BY CHARLES G. STOCKTON, M.D.,

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GENTLEMEN,—I will ask your attention to some new therapeutic applications of an agent of which I have already spoken when referring to the Shurly treatment of consumption. It is the double chloride of gold and sodium. Two years ago I was very much taxed to find some means of relief for a woman who had just passed the menopause, who had increased in flesh, who had lost in strength in all ways,—muscular, digestive, circulatory, and respiratory. Her mentality was disturbed; she was nervous and weak and could not stand any prolonged mental action. She had an occasional slight rise in temperature, and had always a coated tongue and constipated bowels. Her liver was somewhat enlarged, her urine showed traces of albumin, and there was marked arcus senilis. She was anæmic, and changes could be demonstrated in the walls of her arteries. In the waste products which her urine contained was found the evidence that the blood was loaded with effete material.

She had what is called lithæmia,—not the lithæmia of young people, but the toxæmia which comes on in middle life when age begins to tell. Those of you who are students and are lovers of beautiful writing will be interested in reading what Sir James Paget says of fatty degeneration. Men grow old by either fibroid or fatty degeneration: they shrivel and wither up or they grow fat and flabby. In either case there is weakness and diminution in functional power: in the one case there is the thin and shrivelled old man, and in the other the fat and puffy old man who has shortness of breath, poor digestion, large liver, and presents the evidences of fatty degeneration in general. This

woman exhibited these evidences, and many another woman will show the same evidences in fatty change at that time in her life. Little has been found useful for the relief of such cases. Hygienic measures, massage, change of air, care in diet, and attention to the emunctories will produce some benefit, but no medicine directly given for the condition has proved of special service. It occurred to me that this woman was growing old before her time, degeneration coming on at fifty instead of sixty-five or seventy, and it seemed to me that something might be done to prevent this change. Arsenic, potassium iodide, and other alteratives had been suggested, but in looking over the list the double salt of gold and sodium occurred to me. With the special idea of relieving nervous symptoms, I gave her a pill containing one-twelfth grain of this preparation three times daily. This was about two years ago. She made very steady improvement, and considered herself better than she had been for several years. I lost sight of this case, and I have no definite idea of the final result. A second case, which I treated in this way about a year ago, has improved. I have given this remedy now in probably twelve cases of a similar kind, and, whether it is a remarkable coincidence or whether it is a fact that here is a new application of this medicine, I have seen enough to warrant me in saying that for old, lithæmic patients quite uniform improvement in all ways apparently follows the use of this medicine continued for several weeks or months. It will tax you to obtain improvement by the treatment of patients in the usual way. I should like to invite your attention to this drug, which can do no harm, and which seems to do much good.

Last spring this patient whom I show you to-day was under ordinary forms of treatment for certain changes in the joints which are usually called arthritis deformans. Last fall I put her upon the treatment which I had given for this so-called fatty degeneration, and, rather to my surprise, the arthritis deformans began to pass off. The acute state subsided very quickly and the deformity very rapidly diminished. Now, it is the habit of arthritis deformans to go in undulations; it has periods of excitement and periods of subsidence; and it is hardly safe to say that this woman was improved by the remedy. One might easily say that she had reached that stage when improvement is to be expected. I foresaw that difficulty, and I proceeded to try the remedy in other cases. I have now several cases of joint-trouble under treatment with the double chloride of gold and sodium, and I intend talking to you to-day on the subject of arthritic troubles with special reference to their treatment by this double salt.

This man you have seen in the wards and in clinics on numerous occasions. He has suffered for about two years from the deformities which you see here. The trouble began in his knees, and it now affects both the smaller and the larger joints. He can hardly walk, he can scarcely use his hands, and besides the changes going on in the joints there is atrophy taking place in the muscles,—a common occurrence in connection with joint-disease. There is effusion in some of the joints, and there seems to be effusion along the sheaths of the tendons; at the wrist there is a large collection of fluid, resembling a weeping sinew. I had little hope of improving the man by the remedy, because I did not consider this a case of arthritis deformans in the ordinary sense of the word. However, I put him upon this double salt of gold and sodium, and the second day afterwards the man surprised me by reporting that he felt better, and in three or four days I could see an improvement myself. The wrist has changed wonderfully; the great mass of exudate has gone away; there is no weeping sinew. Is it a coincidence or is it a fact that in this salt of gold and sodium we have a remedy which has been lying obscure for generations and which we are waking up to find of considerable importance? It is the remedy that Dr. Shurly is employing in his treatment of tuberculosis. What is going to happen in this remarkable case I do not know. Later we may be disappointed in the action of the drug. The patient is getting now one-tenth grain three times daily. He says he feels better and can eat better. The swelling in the knee, wrist, and ankle is growing less, he affirms. We will measure the joints, so as to verify their asserted diminution in size. Often I have seen patients improve in many respects just because one condition had been improved, and if you give hope to a man you give him the best kind of medicine for the time being. This man has been in the hospital for months, under ordinary routine treatment, and he is now under the same conditions with regard to hygiene, diet, etc., as he has been all along. For some time before I began the use of the double chloride of gold and sodium he had not been taking any medicine: so that we cannot attribute the improvement to the withdrawal of any drug.

The man whom I showed you Saturday, suffering from some form of joint-trouble, I promised to bring before you again to tell you what he did have or did not have in the way of disease. He is still improving, he says, though he has a slight cold to-day and his knees feel a little stiff. The swelling in his right wrist, he thinks, has diminished since Saturday. He has had this joint-trouble for about two years. It first appeared in the right knee, and then it extended to the

smaller joints. He has some trouble about his jaw. His hips are nearly ankylosed. He has had no fever during the course of the disease. He had considerable pain at its beginning. There seems to be no trouble with the toes. The metatarso-phalangeal articulation of the great toe is a favorite seat for the appearance of pain, redness, heat, and swelling in a certain affection. This may come on quite suddenly, usually in the small hours of the night, and pass off after a rise of temperature and a sweat in the morning, the swelling going away somewhat, the pain and fever altogether. This is accompanied by almost complete suppression of the excretion of uric acid and a lessening of the excretion of urea, which condition is followed by a vastly-increased excretion of urea and a large excretion of uric acid. This is attended by irritability, sleeplessness, disturbance of digestion, and the disease goes under the name of podagra, or gout.

Gout may appear also as a chronic disease. When it appears in this form it is apt to show its changes in those joints which the disease seeks out in its acute manifestations, and we are apt to find enlargement in the toe joints, particularly in the metatarso-phalangeal joint of the great toe. The enlargements are due to the deposition around the sides of the joint and in the synovial surfaces of urate of sodium. This is a chalky deposit making what are known as tophi. These are sometimes so large and come so near the surface that the skin is pressed upon and atrophies and there appears through the skin a small chalky mass. Such a mass occurring upon the knuckle in a case on record is said to have been so prominent that the man could write his name with the knuckle. These tophi appear also in the ear. This man has no history of acute or chronic gout, and this chronic joint-affection is not gout.

Now, rheumatism is a disease which attacks the joints. In its acute manifestations it may attack any joint or other synovial structure of the body, and when there is chronic rheumatism the lesions are apt to be located in the places where the acute rheumatism has been. This man gives no history of acute rheumatism. You will ask, "Cannot rheumatism be chronic from the beginning?" I have no doubt it may be, but when there is chronic rheumatism you will find an over-secretion of synovia. There is a certain amount of fluctuation in the joint; there is also an increase and thickening of the fibroid structure of the joints, and they very often remain enlarged for a very long time, occasionally throughout life. With this are conjoined the ordinary symptoms of chronic rheumatism,—vague pains, relaxation of the skin, a tendency to sweat, acid and concentrated urine, indigestion, etc.

I think we may safely say that this man has neither gout nor rheumatism.

There is a disease which Charcot described ten years ago, and called an arthropathy. The arthropathies occur usually, as the lesion occurred in this case, first in the knee-joint; they may extend to other joints in the body. I have seen several cases where they appeared in the joints of the hand, where this man's trouble is also located. The arthropathy is attended by a synovitis, by great fluctuation, by an increased mobility of the joint, at first slight but very soon becoming extensive, so that dislocations may easily occur; and the disease tends to continue in spite of all that is done to overcome it. It is a disease which is usually found to accompany—so Charcot has said—locomotor ataxia, or tabes dorsalis, and it is explained by Charcot and his school, although it was not first observed by Charcot, as being the result of some peculiar nervous affection affecting the afferent nerves. The shooting pains and loss of sensation in tabes dorsalis are the result of the extension of the disease to the afferent nerves in some way which he does not explain very thoroughly. Charcot thinks that the degeneration is carried from the posterior columns of the cord to the anterior horns and there affects the gray cells which have to do with the nutrition of the joints. The anterior horns of the cord must be diseased if the joints are affected by a local disturbance, and, since tabes dorsalis affects primarily the posterior columns of the cord and not the anterior horns, it must be, if Charcot's explanation of the pathology of arthropathies is the correct one, that the spinal degeneration is extended to the anterior horns.

Many pathologists, and especially the Germans, believe that the joint-change is not because there is any trophic disturbance in the cord, but because the joint is anæsthetic and no longer responds by pain to fatigue or injury, and the man goes on using the joint, not knowing he has synovitis, and further change, further secretion of fluid, further relaxation of the fibrous structures of the joint, result.

Then the mobility of the joint is increased, dislocations occur, and these changes in the joint are accounted for without any reference to the anterior ganglion cells.

The lesions in the early part of this affection are not dissimilar to those seen in deforming arthritis. In the present case, although the knee reflexes are absent, it is impossible to make out an instance of tabes. It is therefore safer for the present to consider it as an example of arthritis deformans; and, to continue the study, I shall prescribe for this patient also the chloride of gold and sodium.

EXOPHTHALMIC GOITRE.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL.

BY WILLIAM OLIVER MOORE, M.D.,

Professor of Diseases of the Eye and Ear, New York Post-Graduate Medical School and Hospital, etc.

GENTLEMEN,—The case before you represents one of those rare examples of Basedow's or Graves's disease, better known by the name of exophthalmic goitre. Occasionally during the year we see in private and dispensary practice cases of this affection, and all of them, in my experience, have had the three characteristic symptoms,—exophthalmos, thyroid enlargement, and rapid heart-action. In the ten cases which I have seen, all were females, and the average age was forty years, the youngest being thirty-one, and the oldest forty five. The size of the goitre and the amount of exophthalmos seem to bear no relation to each other. All had symptoms to which Graefe first called attention,—a disturbance of the usual movements of the eyeball and upper eyelid. When the patient looks downward below the horizontal meridian, the lid no longer follows the eyeball in its movement, but halts in its course. This fault in the action of the lid is supposed to depend upon some defect in the innervation of the orbicularis, as it is not present in persons having prominent eyeballs from other causes. Occasionally the prominence is so great as to cause the eye to be exposed at all times, both when awake and when asleep, as in the case before us. An ophthalmoscopic examination in many cases shows enlarged and tortuous veins and hyperæmia of the optic disk, with some thickening of the retinal layers. The refraction is usually hypermetropic, owing to the exophthalmos and flattening of the lens by pressure, and I have seen the hypermetropia vary with the degree of prominence of the eyeballs. Irritation of the cervical sympathetic will produce symptoms analogous to this disease, and why may not the disturbance in the nervous system be located there, especially in the anterior cervical ganglia, with consequent paresis of the vaso-motor system, and

dilatation of the vessels? In various autopsies the above ganglia have been found diseased, showing hypertrophy of the connective-tissue elements and atrophy of the nervous elements. Others, again, have obtained negative results. Dr. Cheadle, in the St. George's Hospital Reports, describes a case showing capillary dilatation in the medulla oblongata and the upper part of the spinal cord, but without atrophy. Many writers believe in the complex nature of the morbid process. Pannas and Webber incline to the bulbar origin of the disease. The circulatory symptoms are due to disturbance of the functions of the vagus, as well as of the sympathetic. The thyroid enlargement and exophthalmos, the latter being secondary to the orbital changes, are dependent upon the acceleration of the heart and the vascular dilatation. An arterial pulse is sometimes seen in the retina, and the intra-ocular appearances all point to an engorgement of the orbital tissue with blood. There is a venous stasis of the orbital tissue, causing it to become turgid, as in an erectile structure. The eyeballs usually recede post mortem. True hypertrophy of the retro-bulbar tissue is, however, sometimes found. In one of my cases there was a great relaxation of the bowels, the patient having as many as ten evacuations daily, and this diarrhoea was extremely difficult to control. The case before us is important from the fact that the patient lost an eye when, if she had been seen early enough, this disastrous result might have been obviated.

Mrs. C. A. B., aged forty-five years, married, a tall woman, in fair general condition, states that when a child she had the right eye injured by an accident, and that vision in this eye was destroyed, and, further, that one year ago she first noticed the enlargement of the neck, and at the same time the prominence of the left eye. She was frequently oppressed for breath on exertion, and six months after this prominence of the left eye appeared her vision for near objects began to fail. About four weeks ago, before coming under our notice, the left eye became inflamed and painful. For the past year she has been unable to close the eyelids, and has been in the habit of sleeping with the eyes open. The appearance of the patient when first seen, a few days since, was as follows. The right eye showed phthisis of the bulb, with total corneal leucoma. Although the eyeball was atrophied, yet the exophthalmos was so marked that the lids were as full as in the usual healthy state. The eyelids on this side, when shut, fully covered the globe. The left eye was so markedly exophthalmic that the eyelids were retracted to their full extent, and the eyeball literally dislocated through the commissure of the lids; the ocular conjunctiva was

ecchymotic and exceedingly inflamed, and looked like "raw beef." The cornea was infiltrated and cloudy throughout its entire surface, so much so that the pupil could not be seen. At the upper border of the cornea was a serpiginous ulcer; in other words, we had a keratitis from exposure of the eyeball to the air and from loss of nutrition. (The patient was then asked to retire.) As she could only distinguish light and was blind in the opposite eye, she presented a very sad picture. At first glance the left eye appeared to be strangulated: further examination, however, showed that the lids did not press on the eyeball, but that the prominence was due to the great swelling of the orbital tissues. The heart was irregular and frequent in its action, and the pulse averaged one hundred and ten beats per minute. The thyroid enlargement was very marked, and its circumference was fully three inches more than it should have been.

Of the forty collected cases of Graves's disease in fifteen families, heredity is concluded to be the predisposing cause in all the cases. Anything tending to excite or disturb the quietude of the nervous system may be a predisposing cause, and one observer has found that residence in an elevated region is one of the exciting causes. This may seem strange in connection with the statement of another observer that residence in an elevated region has been found to cure the disease,— "*similia similibus curantur*," I suppose. Anæmia has also been considered a cause. The dark discoloration of the skin so often found in many of these exophthalmic cases may suggest a possible suprarenal capsule complication, as in Addison's disease.

All the symptoms of exophthalmic goitre came on simultaneously one year before, without any known cause. One curious phase in this case is the loss of one eye in childhood by injury, which masked the diagnosis for a while, as that eye, being smaller, did not show the usual signs of the affection, but on further examination the full train of symptoms became apparent. Dr. Louise Fiske Bryson, of this city, mentions as a symptom of this disease an inability in the majority of cases to expand the chest. This symptom would point to the already supposed affection of the vagus.

This patient was admitted to the wards of the Post-Graduate Hospital, and the following plan of treatment adopted: first, cutting the outer canthus of the left eye to relieve the slight pressure of the lids on the protruding eyeball, then the application of hot water by compresses used for half an hour, four times a day, the parts being kept anointed with lanoline. By continuing this treatment the infiltration of the cornea was kept in abeyance, except at the centre, where

a perforation took place, with escape of the vitreous and lens. The eye then began to recede, and phthisis bulbi developed.

The lesson to draw from this case is the importance of early treatment of Basedow's disease by constitutional measures, thus preventing the extreme exophthalmos here seen. On finding a case where the prominence of the eye is so great as to prevent perfect closure of the eyelids, a surgical procedure in connection with internal medication for the general disease is called for. The operation which should have been performed had not the cornea been inflamed beyond hope of repair consists in paring the edges of the upper and lower eyelids, and then uniting them through their entire length, and so covering and protecting the eyeball. After a few weeks the lids may be re-opened, and, as a rule, the exophthalmos will be greatly improved, and any corneal trouble which threatened removed. In cases of less marked exophthalmos, the upper and inner third of the upper and lower lids may be freshened and closed, so that the lid is diminished in size, thus retarding the exophthalmos. At the same time the patients should be put upon the constitutional remedies appropriate to this condition. I have presented this case to your notice this morning on account of the rare occurrence of loss of an eye by suppuration, and also for its being associated with a fellow phthisical eye, lost in childhood by injury. The case is unique. So rare is it that an eye is lost in this way from exposure due to exophthalmos, that Wells reports only having seen one case, and in this country I know of only ten reported cases.

As regards the treatment of this class of patients, the following remedies have been suggested: ergot, quinine, the external application of the red iodide of mercury and iodine to the goitre, galvanism to the thyroid and to the cervical sympathetic; and a number of cases have been reported by Dr. Allen McLane Hamilton which have been absolutely cured by an aqueous solution of *hydriodic* acid, given in increasing doses. The "rest-cure" has also been suggested, together with the use of digitalis. Stillé reports a remarkable amelioration of the symptoms in two cases by the influence of high altitudes, and a number of cases have been reported by Hammond, of New York, where the use of *strophanthus* in doses of two drops, increasing to ten drops, has been followed by improvement. Weir Mitchell recommends as an important dietetic measure the use of milk and kumyss. In three reported cases the administration of the cultivated hemp produced marked improvement; and a rhinologist, considering that the body revolved around his specialty, has described appearances resembling

this disease which have subsided after cauterization of the mucous membrane of the nose! In other words, the whole range of the pharmacopœia has been gone through with, and the simple, practical fact to be drawn from the different methods of treatment is that each case presenting must be a study in itself, as in fact may be truly said of almost all cases of nervous affection. In our hands electricity, in all forms, has proved of no service. This disease is purely a nervous one, and the ocular symptom present is the only apology I have for speaking of it at all: it should be truly relegated to the neurological department.

THE THYROID AND ITS DISEASES, WITH SPECIAL REFERENCE TO EXOPHTHALMIC GOITRE.

CLINICAL LECTURE DELIVERED IN THE ROYAL INFIRMARY.

BY THOMAS OLIVER, M.A., M.D., F.R.C.P.,

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GENTLEMEN,—If there is one organ in the body whose function has of late been made a special object of study by physiologists and physicians, but whose pathology has yet to be written, it is the thyroid gland. Of the thyroid, as of all organs, it may be said there can be no reliable pathology until its physiology is understood. Within the last few years there have been many workers in the field, all trying to throw light upon this practically unknown organ; some endeavoring, like Horsley, to find its function revealed in the facts obtained by experimental physiology; others by simply observing and recording phenomena revealed by diseases of the gland; whilst others again, gathering up the data of experimental physiology and clinical medicine and linking them together, have given us a wider pathology of the gland than has ever yet been known.

In the INTERNATIONAL CLINICS, vol. ii. series 2, I briefly reviewed the supposed functions of the thyroid gland. We saw that it was concerned in the making of blood; that if it was not directly hæmopoetic, it was indirectly, its function being to maintain the integrity of the blood by its influence upon metabolism. Dealing with this part of our subject, it ought to be mentioned that Gley (*La Semaine Médicale*, December, 1891) has demonstrated that animals whose thyroids have been removed—*e.g.*, dogs and cats—die very rapidly after the operation, in from twenty to twenty-seven hours. They had incessant muscular shakings, paralysis, convulsions, lowered temperature, and a trace of albumin in the urine. But in order that these effects shall be produced it is absolutely necessary to remove, in addition, a small body which lies just to the outside of the gland on either side, and which, as

it has the same structure as the thyroid, we must regard as an accessory gland. Gley shows that if this body is not removed the symptoms already detailed do not follow,—this embryonic structure enlarges, and is sufficient to fulfil the function of the thyroid gland,—a statement which is supported by facts drawn from the field of pathology, where enlargement of this accessory body has given rise to the symptoms of goitre.

There are three pathological conditions of the thyroid gland that I shall mention. 1. Myxœdema, where the gland is atrophied. 2. Goitre, where it is enlarged. 3. Exophthalmic goitre, or Graves's disease, where not only is the thyroid gland enlarged, but there is, in addition, marked disturbance of the circulation, with protrusion of the eyeballs.

Of myxœdema I shall say nothing, except that in it the thyroid is, generally speaking, atrophied. In what is spoken of as goitre the thyroid is enlarged: it may be only slightly enlarged, or so much so that it forms a large pendulous tumor in the front of the neck, which presses upon the trachea, causing embarrassment to breathing.

The term "goitre" is applied to all non-inflammatory and non-malignant enlargements of the thyroid, and with universal acceptance it is admitted that females are more liable to this affection than males. Goitre shows a distinct tendency to appear in both sexes at the age of puberty. In healthy women the gland is frequently seen to enlarge during menstruation and pregnancy, and to such an extent is this the case that many writers regard the permanently enlarged gland as the outcome of the repeated congestions that have occurred during these particular times.

For centuries past goitre has been recognized as endemic; hence the special names that have been given to it,—*e.g.*, that of "Derbyshire neck" in our own county.

The endemic occurrence and association of goitre and cretinism have long been known. Goitre is met with everywhere over the globe, but goitre with cretinism occurs only in circumscribed areas. It is met with in Europe in the southern slopes of the Alps, in Austria, in the Pyrenees, and among the Vosges Mountains and the Jura. In England the number of goitres is, comparatively speaking, large. The southern and midland counties contribute the greatest number of cases. It is found among the chalk hills of the south and eastern counties, in Derbyshire, and in the counties nearer home,—Yorkshire, Durham, and Cumberland. It is met with in the United States of America, and the interesting point about it is that endemics of goitre seem to come and go. Whilst endemic, or confined to a locality, it may become epi-

demic. This was noticed some years ago in France, where, after one of the regiments had occupied the barracks at Nancy, thirty-eight men became goitrous (Hirsch), next year two hundred and five men suffered, and in the following year four hundred and twenty-five men were attacked with goitre; the strange circumstance about this epidemic being that the regiment which had just vacated the barracks had not suffered, nor had the civil population. In this epidemic, as in almost all which affect the military, the disease was strictly confined to the common soldiers, the officers and sergeants escaping. Only in one campaign do I find mention of epidemic goitre, and that was in 1877, in the Russian campaign against Turkestan, where two hundred and forty-five cases occurred among two thousand seven hundred and fifty-three troops who had captured and held the town of Kokaun. So serious was the epidemic considered that the general in command found it necessary to alter the seat of the garrison. The brave are sometimes very easily disconcerted. A short time ago goitre suddenly appeared among some Brazilian recruits in Goyaz, and so severe was the outbreak that the soldiers took to flight and hastened to their homes.

Many attempts have been made to show how goitre is dependent upon geographical position, states of the soil,—*e.g.*, chalky substratum (hence the name of cretinism, from *creta*, “chalk”); but whilst it is perfectly true that endemic goitre is limited to a few spots,—say one or two particular villages in a county,—and that healthy people coming from a non-goitrous to a goitrous village and living in it subsequently develop the disease, also that by changing their locality they lose the disease or prevent its further development, and that where goitre is endemic animals too may be affected, there is the greatest difficulty in assigning goitre to any geographical or territorial cause. It is therefore difficult to appraise at its proper value the assertion of Saussure that deeply-cleft valleys which receive little sunshine form the only seats of endemic goitre and cretinism. Whilst we admit that goitre is met with in valleys, on the slopes and not on the tops of mountains, the darkness of valleys can scarcely be the cause of it, otherwise it ought to be found in Norway; nor can deprivation of sunlight and air be the cause of it, or the mining population of our adjoining counties would supply us with numerous examples. What the real connection between goitre and subsoil is we do not know. There is probably some connection, for it is frequent in limestone districts and on soils that contain magnesia and sulphuret of iron, as Professor Lebour, of the College of Science, Newcastle, showed a few years ago. I am inclined to admit the existence of some relationship between goitre and calcareous

rocks and sandstone, but what the particular influence is and the manner in which it is employed I do not know; probably it is through the water; and yet it is stated by Berry that mere hardness of water does not cause goitre, nor do the bicarbonate and sulphates of lime and magnesia, to which has been attributed the cause of goitre. On the training-ship which lies in the Tyne, off North Shields, five or six years ago there suddenly appeared a few cases of goitre. Here there could be no question of subsoil at all. That goitre is to a large extent independent of the effects of social misery, insufficient food, filth, overcrowded and ill-ventilated buildings, is shown by the fact that the disease does not attack specially the very poor, but the children of the better working-classes, frequently those who are living in the country. Infirmary cases are not drawn from the slums of large cities; besides, the disease occurs among animals.

Theories in regard to the causation of goitre must be received with caution. Mechanical pressure upon the centre of the neck, as in strain, carrying burdens upon the head, climbing mountains, and chills, are among the suggested causes. Recurrent hyperæmias of the thyroid cannot, however, be so easily overlooked. We know that in some way or other the thyroid is affected during the physiological processes of generation,—viz., menstruation, pregnancy, and childbed. If a woman is living in a district where goitre is endemic, then during pregnancy, when her blood-forming glands are overworked, the thyroid becomes functionally more active and enlarges. At the termination of her pregnancy the hypertrophy may not disappear. This is one reason why males escape the disease more frequently than females. The system of the male is not called upon to undergo the alterations of blood-making and varying arterial tension that occur in the female. It is asserted by Lawson Tait and others that pregnant women with enlarged thyroids bleed very profusely after their confinement, but this is not of universal occurrence, for in the goitrous dales of Durham, Robinson states that “flooding” after parturition is unknown.

We have discussed the various causes of goitre without being able to particularize the exact influence of each, or even to decide whether any peculiar influence is exercised. The question of heredity is also a difficult one. We admit the influence of inheritance to a certain extent.

Is it possible that a special morbid poison underlies endemic goitre and cretinism? The fluctuating nature of the disease and the history of epidemic outbreaks suggest this. By some it is said that the goitrous virus requires a particular kind of soil, and that it is conveyed

through water, but whether it is an organic or an inorganic poison it is difficult to say. It is not a malarial poison. Klebs maintains that he has found the infective agent in the form of a minute organism, a statement in which he is confirmed by Bircher, who detected micro-organisms in the goitri-ferous waters of Switzerland and Austria.

St. Lager has tried to induce goitre artificially. He fed animals with sulphate of lime, carbonate of magnesia, and other salts. The results were negative. Sulphide and sulphate of iron, when given to mice, produced slight swelling of the thyroid, and when large doses of sulphate of iron were given to dogs it produced enlargement of the thyroid, but not sufficient to deserve the name of goitre. Klebs and Bircher attempted to produce the disease by giving goitri-ferous water to animals to drink

as well as injecting them with it, but their results were negative. Berry gave guinea-pigs large quantities of salts of lime, magnesia, and potassium; but although these animals took daily for months as much as two hundred grains of the sulphate of lime, no special changes were observed in the thyroid either by the naked eye or under the microscope. What these experiments show is that goitre is not readily induced in animals by giving them water containing the salts of those metals to which is ascribed this peculiar power, and yet it is known that on the Continent there are certain wells to which young Frenchmen resort who wish to avoid compulsory service in the army. Drinking the water from these wells for a few weeks, they develop goitres sufficiently large to disqualify them for the conscription.

Goitre and cretinism are regarded as different expressions of a single morbid process; goitre being the result of a feeble working of deleterious influences, cretinism the issue of stronger. Cretins are frequently the offspring of goitrous parents, but it is no uncommon

FIG. 1.



SIMPLE GOITRE.—Mrs E., aged forty. During last pregnancy, six years ago, thyroid enlarged, and since then has steadily increased in size.

thing for cretins to be born of parents who are perfectly free from goitre.

Upon simple goitre I shall not dwell longer. Most of you have seen men or women with sometimes very large, pendulous tumors, connected with the thyroid, pressing upon the trachea or the vagi, making breathing and swallowing sometimes difficult, and always irksome, and yet, beyond that, apparently not disturbing their health. A loud, prolonged, and crowing inspiration is heard in nearly all these cases. Men and women both suffer, but I have seldom met with it in the very young,—mostly at or shortly after puberty, and seldom to any extent after sixty. The cases are extremely chronic; their pathology, in a word or two, is hyperplasia and colloid degeneration; and as they are frequently relieved by treatment,—*e.g.*, iodine inhalations, iodide of potassium, and fluoric acid internally, by the injection of iodine into the gland, by splitting the isthmus, or by shelling out a part or the whole of the tumor,—we need not discuss this part of the subject further.

The type of thyroid disease I wish specially to dwell upon is Graves's or Basedow's disease, or what is known as exophthalmic goitre. This, in my opinion, is a disease quite distinct from ordinary goitre, and yet in both cases the thyroid gland is enlarged. In exophthalmic goitre, however, it is not alone a question of enlargement of the thyroid gland; there is behind it an amount of cardio-vascular and nerve disturbance which is of far greater importance than the enlargement of the thyroid.

Though we see a fairly large number of mild cases of exophthalmic goitre among the out-patients of this infirmary, yet it cannot be said that the disease furnishes us with a large number of in-patients. Dr. Beattie, at my request, has gone over the in-patient register of this hospital, and he reports that from January, 1880, to October, 1892,—*i.e.*, during eleven years and nine months,—twenty-two cases of exophthalmic goitre were admitted. Of these, nineteen were females and three males; a ratio of males to females of one to six. The youngest female was aged seventeen. The age period between twenty and thirty-eight supplied the largest number of cases; one woman died at the age of fifty-six. The ages of the men varied from thirty-three to forty-eight.

A girl comes to you complaining of palpitation. You notice that her eyeballs are prominent, and she tells you that this prominent condition has come on gradually, and that it is worst at her menstrual periods. The eyes look as if they would fall out of their sockets, an accident which ere this has happened, for Trousseau relates the case of

a woman whose eyeballs were pushed so far forward that one fell out and had to be put back with her fingers, and O'Neill that of another where the eyeball fell out of the socket whilst the patient was straining at stool. Examining the eyes a little more carefully, and directing their movements up and down, it is noticed that the upper eyelid does not follow the movements of the globe as it ought to do. When the eye is directed downward the lid remains elevated, so that a band of white sclerotic is seen above the dark iris. This, which is known as Von Graefe's sign, is characteristic of Graves's disease, but it is not always present, and, besides, it occurs in other diseases. The prominence of the eyeballs may be more apparent than real, for the upper lid is sometimes kept constantly retracted and retained near the bony border of the orbit. This is known as Stellwag's sign, and when present it aggravates Von Graefe's, for on throwing the eyes downward the upper lid may not move at all. The pathology of these signs is simply this. In Von Graefe's there is impairment of the co-ordination which naturally exists between the descent of the upper eyelids and the action of the inferior recti muscles, whereas in Stellwag's sign there is a tonic contraction of the levatores palpebrarum, although some ascribe it to contraction of Müller's muscle,—a band of involuntary muscular fibres attached to the under surface of the upper eyelid.

Associated with the palpitation and exophthalmos there is an enlarged thyroid. The enlargement affects one or both lobes of the gland. The enlarged thyroid frequently feels under the fingers like a bunch of dilated arteries, and communicates a diffused thrill.

It is the *three* things, palpitation, exophthalmos, and enlarged thyroid, that constitute Graves's disease, and yet it is not necessary to have all these three things present at one and the same time. Long before exophthalmos or fulness in the neck has been observed there may have been palpitation. This may go on for a considerable time, and the exophthalmos be only gradually developed or not appear at all.

FIG. 2.



EXOPHTHALMIC GOITRE.—M. B., aged eighteen; been ill for one year; caught cold when menstruating; flow suddenly ceased. Has menstruated only once since, —viz., nine months ago.

I cannot but regard cases of what is known as *tachycardia*, or very rapid heart, as in some way or other related to exophthalmic goitre, through a similarity in the functional disturbance of the central nervous system. Many cases of tachycardia recover, as in a case which I reported¹ of a young man, aged twenty-eight, who when I first saw him had a pulse of upward of 240 in the minute. This had gone on for several weeks, but the man is now quite well. Other cases of tachycardia die before time is given for exophthalmos and hypertrophy of the thyroid to occur, and yet in these cases, just as in exophthalmic goitre, sugar is present in the urine. What is peculiar about nearly all these cases is that at some time or other in their history blowing murmurs, systolic and diastolic, are heard over the base of the heart. These murmurs come and go, and when they disappear their disappearance may be permanent. It is strange, too, that in spite of the excessive work which the heart does, its rapidity of action extending over years, there is nothing like the amount of hypertrophy or even of valvular disease that one would expect. Whilst the heart practically escapes, the blood-vessels dilate, particularly those of the thyroid, and over these a systolic murmur may be heard. It is upon this dilated state of the thyroid arteries that a theory is founded of the causation of exophthalmic goitre,—viz., that it is a vaso-dilator paralysis.

If I were to present you with a typical picture of a case of exophthalmic goitre it would be something like this. A girl, probably unmarried, of an age varying from seventeen to twenty-five, of rather slender build and slightly emaciated, possibly a little anæmic, more likely, however, sallow and with dark eyelids, through which, and scarcely covered by them, stand out very prominently large, glistening eyeballs, the pupils of which are slightly dilated or irregular,—such a girl complains of intense palpitation, of a gradually-increasing debility and a feeling of unfitness for exertion, of nervousness and a tendency to be irritable and worried by trifles, of loss of appetite, and of epigastric pain after eating, or of diarrhoea,—a train of symptoms not confined to one organ in particular, but suggesting functional disturbance of many organs; symptoms that have gone on for months or years. Placing our hands firmly upon her shoulders, we feel that she is the subject of muscular tremor, and in answer to our inquiry in regard to her family history we learn that one or other parent died of some nervous disease, and that perhaps a sister has suffered in the way that the patient is doing now. There is rarely a history of injury. The one point that

¹ British Medical Journal, 1891, vol. i. p. 217.

can be elicited invariably, however, is that until puberty the patient enjoyed good health ; that the occurrence of menstruation was delayed for years ; that when it came the discharge was scanty ; that once established it became irregular, frequently disappearing for months at a time.

What is the relationship between exophthalmic goitre and disordered menstruation or pregnancy ? The two things are so frequently connected that their occurrence is more than a coincidence. There is in many cases a distinct causal relationship which extends over a lengthened period, or it is short and the disease is very acute, as the following case illustrates.

Some time ago I saw, with Dr. Drummond, of South Shields, a young lady nineteen years of age, who, when almost on the eve of her marriage, had, through an unfortunate quarrel with her lover, not only her expectations thwarted, but such a shock given to her system that she never rallied. Until that unhappy event the girl had been perfectly healthy. She was menstruating at the time. The discharge at once ceased, and intense palpitation almost immediately occurred, followed by rapid enlargement of the thyroid and protrusion of the eyeballs. Within a few days the patient was the subject of one of the worst forms of exophthalmic goitre I have ever witnessed. When I saw her, eight or ten days after the development of the illness, there were not only exophthalmos and enlarged thyroid, but a loud-thumping heart, over which could be heard harsh systolic and diastolic murmurs. The pulse was rapid, and the patient was the subject of extreme restlessness and dyspnoea, which nothing overcame, for she died very shortly afterwards, certainly within a month from the development of her illness. Here, then, is a history of mental shock, sudden suppression of menses, and a fatal form of exophthalmic goitre rapidly induced.

Ovulation and conception are regarded as simple processes, and yet I question if they occur without some impression being made upon the central nervous system. We do not know what the association is. It might seem as if conception,—and by that I do not mean the act of coition, but the impregnation of the ovum as it descends the Fallopian tube, and therefore free from all attachment to the nervous system,—it might seem as if this was an act altogether beyond the consciousness of the individual, and yet I know of the case of one lady who, though perfectly healthy at all other times, has a severe epileptic fit on every occasion that impregnation takes place. To her the pregnancy dates from this fact, all subsequent arrangements being made, and made correctly, by the patient, whom experience has taught the meaning of the epileptic explosion.

We know next to nothing of the extent to which the pneumogastric nerve reaches in the lower part of the abdomen, or of how intimately associated the pelvic viscera are with branches of the sympathetic system. Until we know more it will be impossible to explain thoroughly the diseases we are dealing with. Facts precede theories. The intense nutritive stimulus which pervades the whole system of the healthy girl developing into womanhood, and which is shown not only in the altered mental disposition, but in her improved physique, her better blood-making powers, and her enlarging breasts,—though I do not say that these are altogether dependent upon changes occurring in the ovaries, they are nevertheless associated with them. Health at the period of puberty is due to the balance and equal progress of certain functional activities and organic changes. It only requires that one of the blood-forming glands which has been roused into activity should become inactive or that ovulation should be imperfect, and the result is disease. We have no difficulty in believing that, when the thyroid as a blood-forming gland has been kindled into activity by the advent of puberty, it not only enlarges then, but also with each succeeding menstruation, or remains permanently enlarged during and after a pregnancy. This is a matter of experience, and it shows how closely linked pathological states of the thyroid are with disordered functional activity of the ovaries.

Menstruation is a rhythmic process. Once every four weeks for a certain period in her life a healthy woman menstruates. Rhythm is regularity of succession, and it is the disturbance of this in a woman's life that in some instances induces ill health. Rhythmic movements—those of the heart perhaps excepted—depend upon nerve-explosions. Though we look for a local cause of menstruation in the ovary and uterus, I do not think it is explained by changes there so much as by occurrences in the nervous system. All through the years of a girl's life that intervene between the day of her birth and the establishment of puberty, certain cells in the medulla oblongata are growing and accumulating force, the irradiation of which at the proper epoch not only aids in bringing about the altered physique of womanhood,—the change in the character of respiration from abdominal to costal, for young girls breathe like boys,—but also induces menstruation. Rhythmic explosions of cells in the medulla oblongata are the nervous substrata of menstruation. Why the explosions should occur once a month in health I cannot say, but it is due to them that monthly uterine hemorrhage returns after the ovaries and tubes have been removed, owing to the habit having become so deeply stereotyped or engraven into the tissues.

Believing as I do in a nervous origin for menstruation, and locating it in the medulla oblongata, you can appreciate the connection which exists between disordered ovulation and Graves's disease, for it is in the medulla oblongata that apparently reside the nerve-lesions which underlie exophthalmic goitre. Leurke, of Hamburg, places the lesion higher up in the nervous system than I do, and suggests disease of the cerebral cortex as the cause of it. Taking all the facts into consideration,—the rapid heart, the enlarged thyroid, the prominent eyes, and the glycosuria which is so frequently noticed towards the termination of these cases,—a medullary lesion offers the best explanation of all the symptoms.

The presence of sugar in the urine is a point of importance. It was present in the case of Maria G., and is also present in the urine of one of my out-patients, a woman in whom there are enlarged thyroid, exophthalmos, and phthisis pulmonalis. Budde records two cases; in each there was diabetes. Schafinger relates a case of traumatic exophthalmos which recovered, and Finlayson that of a boy where exophthalmic goitre was accompanied by paralysis of the third nerve. These facts support the theory of a central lesion for Graves's disease; and whilst we know that the origin of the third nerve is above the medulla oblongata, yet in those cases where Von Graefe's sign is well marked, certain strands of this nerve may be implicated.

I admit that I am treading on very uncertain ground in alluding thus to the pathology of Graves's disease; but I know of no other explanation than a nervous one, and with a location such as I have ascribed to it,—viz., the medulla,—that will explain the sudden onset of the disease, as, for example, in one of Trousseau's cases, where in a single night, as the result of excessive emotion, the three cardinal symptoms were developed, or in my own case in South Shields, where, under the emotion consequent upon the rupture of a love-attachment, a girl suddenly developed all the symptoms of the disease, and died within four weeks of its commencement.

Lauder Brunton maintains that the palpitation which is characteristic of this disease, and which is the first symptom, is due to direct stimulation of the accelerator cardiac nerves. These proceed from the vaso-motor centre in the medulla, down the spinal cord, leave it and pass to the inferior cervical ganglion, and from this to the heart. Irritation of the inferior cervical ganglion causes cardiac excitement. The enlargement of the thyroid is explained by paralysis of its vaso-motor nerves. It is to paralysis of the sympathetic fibres that is attributed the dilatation of the small arteries behind the eyeball. These, as they

enlarge, help to push forward the globe of the eye, causing exophthalmos.

The principal post-mortem conditions found in Maria G. were the remains of an enlarged thymus; a thyroid which weighed three and a half ounces, was hard, almost cartilaginous, to the touch, on section ashy-gray; a heart about the normal in size, but whose left ventricular wall was thickened; slightly-enlarged spleen; fatty and rather small liver; apparently healthy supra-renals and kidneys; atrophied ovaries; the membranes of the brain were cloudy at the vertex; brain-tissue was soft and watery, but healthy; in the floor of the fourth ventricle were two translucent and elevated bands, grayish-white in appearance. The condition of the eyes was interesting. Each orbit was packed full of fat behind the eyeball; the lachrymal glands were excessively developed; the ocular muscles were extremely pale and attenuated.

Under the microscope there was distinct hyperplasia of the thyroid; its cells were much increased in number; there was marked nuclear proliferation among the muscle-fibres of the heart, and distinct sclerosis of the ovary, but nothing abnormal was detected in the central nervous system.

The treatment of these cases is only occasionally satisfactory. Belladonna sometimes gives good results; probably the best results have followed galvanization of the cervical sympathetic, the negative pole being applied to the cervical ganglia on each side alternately.

DIGESTION AND SOME OF ITS DISORDERS.

**CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL
SCHOOL AND HOSPITAL.**

BY GEORGE B. FOWLER, M.D.,

Professor of Clinical Medicine (Urinary and Digestive Disorders).

THIS is a subject which is taught, of course, to students, but as a rule the general practitioners neglect it. My experience has been that physicians are less familiar with the physiological data governing nutrition than they are with almost any other branch of medicine and surgery, forgetting the fact that the process which we call digestion is the very basis of all physiological phenomena, and that disorders of this function are the most common with which we meet; that they give rise to a series of symptoms which are very distressing, and yet are curable.

I will endeavor to present to you to-day a few fundamental considerations regarding digestion and its disorders, which are of prime importance to the physician.

If you think of the various crude elements which constitute the food, on the one hand, and then for a moment consider what are the proximate principles making up the tissues and fluids of the body, you will have some comprehension of what the processes must be which transform these crude elements into tissue-substances.

Starting with this point, of the conversion of crude materials, which we call food, into substances which shall be applicable for the nutrition of the body, we have to say at the outset that the process by which they are converted is, at the beginning, one of fermentation. These materials, notwithstanding their varied nature, are easily classed under several heads. If we wanted to make a schedule, we would say that food consisted of certain proximate principles, and by proximate principles we mean all substances which exist in the tissues or in the elements of food, and which can be isolated under their own form; that is to say, without decomposing them; just as I can take a solution of

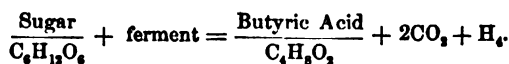
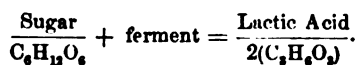
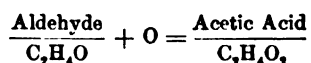
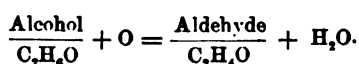
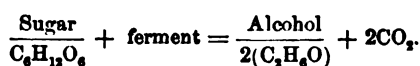
salt and water, of which the proximate principles are the salt and the water respectively, and by the gentle application of heat evaporate the water and collect it by a simple apparatus, and the salt will be left in the vessel. There has been no decomposition here. The proximate principles contained in the food can be separated from it under their own form. They consist of starch, sugar, fats, albuminoid substances, salts, and water. Certain of these are analogous in their chemical composition, or possess physical and chemical properties which make them alike. On this account they have been grouped under the heads of carbohydrates; hydrocarbons; albuminoid substances; water; salts. The first three are, of course, organic in their nature; that is to say, they are derived from organized bodies. The last two are inorganic, and comprise water and all the known mineral salts. The carbohydrates include the sugars, starches, gums, and some other allied unimportant substances. They are called carbohydrates because they consist of carbon and hydrogen and oxygen, in the first place, but principally because the hydrogen and oxygen are present in the proportion to form water. For instance, we have starch, $C_6H_{10}O_6$, in which the hydrogen and the oxygen, you see, are in proper proportion to form water. The composition of sugar is $C_6H_{12}O_6$, and you will observe that the only difference between starch and sugar is one molecule of water (H_2O).

Now, we know that in the saliva there is a ferment which we call ptyalin, and in the pancreatic juice a ferment which has been partially isolated, and both of these ferments have the power of converting starch into sugar. We also know that in the ripening of fruits and vegetables, sugar is evolved from starch under the influence of a vegetable ferment, and that a similar change takes place in the cereal grains by the action of diastase. The taking up of water by a substance under the influence of a ferment is called hydrolytic fermentation. Not only is starch digested by this process, but every kind of digestion that goes on in living bodies is simply the taking up of water under the influence of certain kinds of ferments. Albuminoid substances, under the influence of the gastric and pancreatic juices, become hydrated and converted into peptones, and we are in the habit of saying that this process is the one which characterizes the normal condition. You are well aware that there are other kinds of fermentation besides the normal ones. There are fermentations which take place in the alimentary canal with the formation of disagreeable and poisonous products, and these are the substances which are produced by fermentation other than hydrolytic. They are fermentations which are due to certain organisms

which we call pathological. They are those which are taken in by the mouth with or without the food and give us those by-products which are known as the pathological ferments of indigestion.

I was a long time endeavoring to understand what these products could possibly be, and what ingredients of the food could possibly give rise to the gases and acids which were encountered so frequently in persons suffering from indigestion. It has been pretty satisfactorily settled to-day that it is the sugars and starches, or, in other words, the carbohydrates, that are capable of these pathological fermentations. Experimentally, we can decompose the sugars into the substances which we find in the stomachs and intestines of dyspeptics, and they are alcohol, acetic acid, carbonic acid, butyric acid, aldehyde, hydrogen gas, and marsh gas. I will give you the formula by which we will clearly see how it is possible for sugar to be converted into these various by-products.

The chemical formula for sugar is $C_6H_{12}O_6$; it is capable of being converted by the common yeast-plant into carbonic acid and alcohol: so we have alcohol and carbonic acid gas to begin with, and the other products follow.



Sir William Roberts holds that at all times when acid reactions occur in the stomach, or when its contents are decidedly acid, the acid is hydrochloric, and says that he has never seen any gas except a little carbonic acid gas generated there. I have seen marsh-gas eructations from the stomach, proved by the fact that the gas caught fire. I had one patient with a dilated stomach who used to eructate enormous quantities of gas, the nature of which we did not suspect until one day as he was lighting a cigar the gas ignited. Undoubtedly this marsh gas is not infrequently produced. The production of these substances occurs in various forms of indigestion. I have been able to recognize two

very common forms of dyspepsia, and, although there are many modifications of the chief symptoms, it is to-day my purpose to speak of these two as types. I recognize a dyspepsia which is characterized by flatulence, by torpor of the bowels, by the individual being anæmic and depressed and generally run down, with a lack of appetite and sense of weight in the region of the stomach after eating. If such a case as that presents itself to you, you can conclude that it is one where the digestion is weak, as are all the other functions of the body, and with such an individual you are very apt to fail in treatment until you look beyond the organs where the symptoms chiefly reside. The only way in which we can ascertain at the beginning that the whole trouble is due to the want of proper nutrition is to analyze the blood, when in the majority of instances we shall find that the patient is anæmic, and by putting him upon a proper preparation of iron, which in my opinion is the carbonate, as contained in Blaud's pill, and restricting him to articles of food which will be easily digested and which will not ferment, you will be surprised to see how quickly he will be relieved of his symptoms. In order that iron shall do any good at all in anæmia, it must be given in excessive quantities, because most of it escapes, and the only preparation you can give in large quantities without upsetting the stomach is the carbonate. In such a case as I have described, you will not get the stomach to act by prescribing the ordinary digestive agents. If I use the three-grain Blaud's pill, I begin by giving one after each meal to-day, two after each meal to-morrow, and thus go on increasing until the patient takes eight three times daily. Keep at this limit for three days, and then decrease the number daily in the same ratio as they were increased, and then begin again. You will be surprised to see what brilliant results may be obtained by giving the iron in this way. The bowels may become constipated when two or three pills are taken after each meal, but when the number has been increased to five or six the iron acts as a mild cathartic.

The other common form of indigestion is that where there is not much gas, but where acid eructations are a constant and prominent symptom. The urine is high-colored, very acid and scanty; deposits urates and uric acid. These patients will tell you about a sense of burning in the back of the throat. They may be nervous and apprehensive, and perhaps have some eczema and urticaria. They suffer from bad dreams, and never feel at home unless they are under some form of excitement. By examination you fail to elicit the fact that there is very much flatulence; they are not especially constipated. This condition can be characterized as an acid dyspepsia. The excessive

acid is either an excess of the hydrochloric acid of the gastric juice, or it is one of those rancid acids which I have indicated as being capable of development in the fermentative processes of the stomach. The only practical way to ascertain which of these it is, is to try two methods of treatment. If it is a rancid acid which is due to fermentation that takes place in the stomach, you will have to exclude those articles of food which are capable of undergoing this fermentation,—that is, the carbohydrates and fats. Put your patient upon a pure meat diet, with such vegetables as salads, cresses, etc., and give him hydrochloric acid after his meals; if that does not help him, give him the hydrochloric acid before his meals also, because the ferment which produces fermentation acids is not capable of living in the normal gastric juice, and by administering the hydrochloric acid you are most apt to kill this ferment. A symptom which indicates that the acid dyspepsia is due to the fatty acids is this burning or stinging in the throat, which is caused by the regurgitation of food into the lower end of the œsophagus. If the acid dyspepsia is not due to butyric or acetic acid, it is due to the excessive production of hydrochloric acid, and the best way to ascertain this fact is by treatment. In order to correct the excessive secretion of hydrochloric acid you can administer an alkali in very large doses after meals, twenty or thirty grains of sodium bicarbonate together with twenty of bismuth subcarbonate. You well know that the administration of an alkali before meals increases the secretion of hydrochloric acid; also that the administration of an acid before meals decreases the secretion of hydrochloric acid. In this way its supply can be regulated. I have very little faith in the various antiseptics which some of us are in the habit of giving by the mouth to disinfect the stomach and intestines. Carbolic acid, the alpha and beta naphthols, Labarraque's solution,—all those things I have tried and never succeeded in getting the specific effect from them. Theoretically they should act, but practically they do not. I rather depend upon careful regulation of the diet, and hot water, and by proper medication attempt to cure the accompanying catarrh. My favorite prescription for acid fermentation is as follows:

Magnesium carbonate, $\mathfrak{z}\text{i}$;
Sodium bicarbonate, $\mathfrak{z}\text{i}$;
Bismuth subcarbonate, $\mathfrak{z}\text{ss}$;
Lycopodium, powdered, $\mathfrak{z}\text{i}$.

I have this put up as one big powder, and let the patient take a teaspoonful three times daily, after meals. The lycopodium is a drug

that is used a great deal by the homœopaths. Its active principle is a resin which resides in little cones, and I can vouch for its efficacy in relieving pressure and other distressing symptoms in the chest and abdomen in persons suffering from acid fermentation. The dose of the medicine can be regulated according to its effects on the bowels. Instead of the subcarbonate of bismuth, the salicylate can be substituted if there is a rheumatic tendency.

There are many other remedies available in these troublesome affections, of which we shall frequently have occasion to speak. Some of you, no doubt, wonder why I have said nothing about washing out the stomach. As regards this procedure, I will only remark now that I employ it much less frequently than formerly. It does not come in as a routine treatment, and is only necessary in properly selected cases. What I have said to-day is intended as a simple exposition of a very complicated subject.

A CASE OF ANEURISM OF THE ARCH OF THE AORTA.

CLINICAL LECTURE DELIVERED AT THE SOUTHERN MEDICAL COLLEGE, ATLANTA, GEORGIA.

BY J. McFADDEN GASTON, M.D.,

Professor of the Principles and Practice of Surgery, Southern Medical College; Ex-President Southern Surgical and Gynecological Association.

GENTLEMEN,—I have to present to-day some details in connection with the treatment of a case of aneurism. You will remember that I. W., a white man, forty years old, with two projections above the edge of the sternum and the adjoining portions of the clavicles, was presented before the class at the clinic of November 29, 1891.

The patient was examined personally by the members of the class, so that each will recall the fact that there was distinct pulsation in the tumor, and it was diagnosed as aneurism, most probably of the innominate artery. This conclusion was reached by the history of the case and the existing developments. The first intimation of trouble, about two years ago, was an elevation or prominence of a conical shape within the upper border of the sternum, which steadily but slowly increased and subsequently extended beyond the sterno-clavicular junction on the right and left sides. There was eventually a greater prominence, of a conical form, on the right, and a lesser spheroidal development on the left, with a marked depression between the projections. Prior to the appearance of this pulsating tumor at the sternal border, there was no report of trouble which led the family physician of the patient to suspect aneurism. The inference to be made from these circumstances, together with the more rapid development of the tumor since rising above the edge of the sternum, led me to form the diagnosis of a sacculated aneurism of the innominate artery. As was stated on that occasion, it could not be a fusiform aneurism of that vessel, but most likely originated in a comparatively small opening, which view was

strengthened by the absence of bruit or other abnormal sound in the tumor or upper part of the thorax.

The various modes of dealing with aneurisms of this character were explained to the class in the presence of the patient and of his physician, Dr. A. Moody Burt, who accompanied him. The plan of introducing wire or other foreign substances into the sac had not been attended with satisfactory results, and the resort to electrolysis or irritation by puncture with needles offered little encouragement. It was asserted that the use of pressure by relays with the fingers or some mechanical means was the only recourse, short of ligation of the carotid and subclavian, conjointly or separately, which gave promise of relief. The changes which occur, in the yielding of the inner coats and the dilatation of the outer coat of the artery, for the formation of aneurism, were then described, and the infrequency of spontaneous cure or disappearance under the use of medicines was noted. It was, however, stated that iodide of potassium had been resorted to with apparent benefit in some cases of aneurism; and it will be remembered that I referred to an instance of an aortic aneurism which wore through the sternum and protruded externally, having disappeared while using this medicine in alterative doses of from ten to twenty grains three times a day. This patient has been using iodide of potassium, and is advised to continue it, but thus far it does not seem to have had any effect in arresting the enlargement of the tumors. If perseverance in this course should not be attended with some more marked effect than heretofore, my advice was to submit to an operation within two or three weeks, as delay in these cases might be attended with rupture or other serious complications.

Upon the return of this patient on December 10, you were informed that I had advised him to submit at the outset to digital compression, and I was pleased to have your co-operation in keeping up this pressure. Squads of three of your number relieving each other every hour and a half, allowed each to make digital pressure for fifteen minutes at a time, and maintained an uninterrupted compression on the carotid and subclavian arteries. For the space of thirty-six hours consecutively this measure was fairly tested. It was found that the cuticle of the surface pressed upon over the course of the subclavian artery, below the clavicle, was denuded to such an extent as to necessitate shifting the pressure above the clavicle. But the discomfort to the patient, of the thumb placed over the artery at the tubercle of the first rib, above the clavicle, was such as to lead to its abandonment. In the mean time the abraded surface below had been coated over with

collodion, and I devised mechanical compression with the hard-rubber pads of two small spring trusses over this point and also over the site of the carotid, below the omo-hyoid muscle. The spring of the former was carried around the neck and the spring of the latter placed over the shoulder, in a way to give fixedness to the pads in their respective positions, and the pressure was apparently kept up by this means quite as effectively as it had been done by the thumbs, without the great inconvenience of changing the application every fifteen minutes. This was continued for twenty-four hours longer, when a sense of choking was complained of by the patient, due, it was supposed, to the reflex irritation from the pad pressing upon the pneumogastric nerve. I then removed both the spring trusses and placed a firm roller of homespun cloth immediately above the right clavicle, and secured this by a bandage carried around under the left arm, making pressure on both vessels. This was not attended with discomfort to the patient when the bandage was moderately tight, and graduated pressure was continued by this means until the evening of the 16th of December, when all compression was discontinued.

A temporary interruption of the use of the compress above the clavicle, on the evening of the 15th, for the purpose of examination by my colleagues, Drs. W. S. Elkin and W. P. Nicolson, led to an observation by the patient, which was confirmed by my examination, that the pulsation in the conical prominence became more distinct than while the pressure was maintained, while there was but little if any difference in the pulsation of the spheroidal portion of the tumor. You are all aware that the circulation was not at any time during the continuation of the digital or the mechanical pressure arrested entirely in either the carotid or the subclavian, but there was a marked diminution in the tension of the temporal and radial arteries, showing that the force of the current was modified by the pressure. You will also recollect that the conical prominence had a more solid feel when palpated than the spheroidal projection on the left, from the outset, and that this solidity seemed to increase with the continuation of the pressure. I was encouraged to hope for an obliteration of the aneurism by progressive coagulation, but in the further progress of the treatment no material change was produced in this respect. It is proper to mention in this connection that, in the deliberation with my colleagues touching the measures to be adopted in the case, it was suggested by Dr. W. P. Nicolson that both the carotid and the subclavian might be exposed and ligatures passed around each without knotting either. At this stage of the proceeding, tension might be made on the ligature

upon one or the other, or upon both, so as to arrest completely the circulation in the respective vessel or both vessels, thus testing the effect on the patient. Should this experimental occlusion show the safety of ligating the two arteries synchronously, the ligatures might be tied on both. If, on the other hand, trouble should ensue from the occlusion of the carotid and the subclavian at the same time, and no perturbation come from the occlusion of either the carotid or the subclavian separately, it would be well to ligate only the one which is not followed by disturbance and leave the other without ligation. It turned out that, owing to sickness, Dr. Nicolson was not present at the operation, but, in consideration of the possible advantage of such experimental proceeding, I should be disposed to give it a trial in a similar operation. So far as I am informed, no precaution of this nature has been heretofore submitted to the consideration of operators in this class of cases.

With a view to modify the cardiac impulse after discontinuing the compression of the arteries, the patient took thirty drops of tincture of digitalis every three hours until one hundred and twenty drops were taken, with but little effect on the circulation.

On the morning of the 17th serious disturbance of the respiration, with a choking sensation and vital depression, indicated urgency in the performance of an operation. Upon auscultation, no bruit was discovered in the tumors or in the chest, nor could I detect valvular derangement, but the heart's impulse was less forcible than natural. The temperature was normal, and the pulse in the erect sitting position was one hundred and twenty beats to the minute. After giving a hypodermic of morphine, gr. $\frac{1}{4}$, atropine, gr. $\frac{1}{160}$, the A. C. E. mixture was inhaled from an ordinary cone, and the operation was performed at one o'clock P.M., in the presence of a number of the medical class, at the Providence Infirmary. I had the active co-operation of Drs. W. S. Elkin and C. E. Johnson; there were present also, as assistants, Drs. R. C. Wiley, Bernard Wolff, L. B. Grandy, J. A. Childs, N. O. Harris, R. R. Kime, and J. H. Green.

The incision was made, three inches in length, behind the border of the sterno-cleido-mastoid muscle, as it was drawn forward by the tumor. Dividing the subjacent tissues upon a grooved director, the internal jugular vein was found much enlarged, with agglutination of its thickened coats to the artery beneath. This may have resulted from the digital and mechanical compression over this region. At my request, Dr. Elkin used the point of his index-finger to separate the vein and the artery, keeping an eye to the nerve also. He passed the aneurism-needle so as to include only the artery, excluding the vagus,

which lay within the line of the jugular vein and the common carotid. A large catgut ligature being passed through the eye of the aneurism-needle, the artery was encircled, and, taking each end of the ligature between the fingers, so as to lift up the vessel in an angular form, the flow of blood was arrested. Making a careful examination, I felt distinctly the pulsation on the cardiac side and none on the distal side of the line compressed by the tension of the ligature. This occlusion, kept up during our verification of the proper placing of the ligature before knotting it, was not attended with any marked effect upon the condition of the patient. It was therefore inferred that the completion of the ligation might be accomplished with safety, and I drew the knot down, when, to my great surprise, the catgut ligature broke in the knot. A portion of this same piece of catgut had been subjected to all the force I could use with my wrapped hands, without yielding, and yet snapped when pressed with moderate force of my thumbs in tying the first knot. Having experienced similar accidents with catgut ligature in previous operations, I shall abandon it in future for the tendon of the tail of the kangaroo or the opossum, which has proved so serviceable with Dr. H. O. Marcy. Again the patient had been subjected to temporary occlusion of the artery without any notable bad effect, and I felt encouraged to expect that he would undergo the final operation satisfactorily. A strong iron-dyed silk ligature was now used for the ligation, and immediately after it was secured by a double knot my assistants who had charge of the pulse stated that it had ceased to beat. Soon afterwards there was a disturbance of the respiration indicating a very serious condition. The body of the patient was suspended by the lower extremities being held aloft, and artificial respiration was undertaken by raising and lowering the arms, with alternate pressure and relaxation over the lower portion of the chest; but only an occasional gasp was observed to encourage our efforts. Hypodermics of whiskey were alternated by those of sulphuric ether during several minutes, without effect. The patient was then placed in the horizontal position and turned from his back to his left side with fixed intervals, making pressure upon the thorax at each change to the dorsal attitude. But all availed nothing, as changes had taken place which precluded the restoration of the patient.

He died so suddenly that there might have been a suspicion of fatal anæsthesia supervening, as often happens, without any preliminary disturbance. But the cessation of the pulse and the interruption of the breathing, following immediately upon the closure of the common carotid artery, leaves no doubt as to the cause of death. The

heart being weak, nothing more was requisite to arrest its action than the regurgitation of blood into the left ventricle, accompanied by the cerebral anæmia on the right side from the complete arrest of the circulation through the common carotid artery by the tying of the ligature. It might seem an omission in my report of facts observed by my colleagues, had it not been verified afterwards, that the nerve was not included in the loop of the ligature.

At the autopsy, held five hours after death, there were important revelations in regard to the extent of the aneurismal developments within the thoracic cavity. While it was surmised by some of those who had examined the case that the aorta might be involved, there seemed to be no sufficient grounds for inferring that the spheroidal and conoidal sacs did not originate from the innominate artery.

Upon cutting through the cartilages of the ribs on each side of the upper portion of the sternum, and sawing across the latter so that it could be raised, I found an immense dilatation of the entire arch of the aorta, constituting a huge fusiform aneurism, filled with ordinary post-mortem blood-clot, and opening from its upper anterior wall, the two sacs rising behind and above the sternum and sternal attachments of the right and left clavicles. The left sac was occupied by a coagulum corresponding to that in the large aortic cavity, while the right conoidal sac, which had given the impression of solidity, was filled with a mass of organized fibrous matter which presented a laminated formation, and extended down beyond the plane of the dilated aortic wall in a separate layer three-quarters of an inch thick, upon which the conical solid mass rested without being adherent to it. When the apex of this was cut, it gave much the same resistance to the knife as in cutting the heart's muscular structure, and presented an appearance not unlike that of this tissue. My inference is that a gradual fibrinous deposition of the blood-elements had been taking place for a considerable time, forming the conical projection, which was separated by a septum from the spheroidal prominence, whose contents had not undergone any solidification. It may be a fair deduction that the broader layer at the base of this cone and distinct from it had developed in the course of the graduated pressure upon the carotid and subclavian arteries during six and a half days, making one hundred and fifty-six consecutive hours. This view of the changes taking place would imply a progressive deposition, tending to obliteration of the aneurismal dilatation of the arch of the aorta and warranting delay in resorting to any operation. But, on the other theory of aggravation of his condition after all pressure had been withdrawn, as presented on

the morning of the 17th of December, there rests no doubt in my mind as to the propriety of proceeding at once to the adoption of the measure inculcated by precedents in the treatment of aneurisms of the arch of the aorta. The serious character of the symptoms during the attack preceding the operation indicated a speedily fatal result, and it was, from this point of view, incumbent upon us to afford the patient a chance to escape by ligation of one or both arteries emanating from the site of the aneurism, as sanctioned by good authority.

Neurology.

MULTIPLE SCLEROSIS; TRAUMATIC TREMOR, RAILWAY SPINE.

CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA HOSPITAL.

BY F. X. DERCUM, M.D.,

Professor of Nervous Diseases in the Jefferson Medical College, and Neurologist to the Philadelphia Hospital, etc.

GENTLEMEN,—The last time I had the pleasure of meeting you we had before us, you will remember, a number of cases illustrating that remarkable disease paralysis agitans. The tremor ceased in most instances upon voluntary motion. In some of the more advanced cases it simply became lessened. In no case did it become increased upon voluntary movement. It is my intention to-day to show you a number of cases in which tremor is also present, but differs markedly from that in paralysis agitans. Other symptoms, too, so striking in this disease, will here be conspicuous by their absence. I bring before you two patients. The first you recognize as one of the cases of paralysis agitans before you in the last lecture. You again remark the rather fine tremor, the peculiarity of the attitude, the head and shoulders thrown forward, and the arms semi-flexed, the fingers in the position of the writing hand. You again note the fixed expression, and, as the patient moves, the rigidity of the neck and shoulders. Again, when he raises his arm you see that the tremor ceases.

In the second patient you also observe tremor. In striking contrast, however, to the case of paralysis agitans, he has not only marked tremor of the hands and arms, but also of the head. Further, you see that as I speak to him he readily follows me, not only with his eyes, but also with his head, turning half around, in fact, to answer my questions. His countenance, too, is markedly different from the patient at his side, for as he gives me an account of his case you observe a decided play in the muscles of expression. You further note that the tremor, instead of being fine and rhythmical, is coarse, irregular, and jerky. Again, when I ask him to raise his arm you see that the tremor, instead of ceasing, becomes markedly exaggerated. I

now place the man upon his back on the bed, and in a little while, when he settles into position and his muscles become relaxed, you see that the tremor everywhere ceases, and ceases absolutely. However, the moment he raises the hand or foot, be the movement ever so slight, the tremor is re-established. As he raises himself to leave the bed it becomes even violent.

Let us place the patient with paralysis agitans in bed, and see what happens. You note at once that the tremor, instead of ceasing, persists, and only on making an effort, such as raising the hand, does it disappear. Evidently the conditions governing the tremor in the two cases are exactly opposite. However, as I pointed out at my last clinic, the diagnosis of paralysis agitans should not be based upon the tremor alone, but upon the concomitant symptoms as well, as it occasionally happens that the tremor persists during voluntary movement.

Returning to the other patient, I may tell you now that he illustrates the affection known as multiple cerebro-spinal sclerosis. This is a disease which may occur at almost any time of life, but is more common, according to European writers, in the middle or early half of the adult period. Our patient is sixty-four years of age, and was already fifty-seven at the time the tremor first made its appearance. He is, therefore, an exception to the average rule. He is unmarried, a stone-cutter, has drunk moderately, and denies specific disease. He had had no illness of moment up to one year and a half before the accident. At that time he suffered from a sunstroke. It was in the month of July. He was cutting stone and exposed to the sun. He fell unconscious, and was confined to bed for two weeks. When he got about again he was quite well, with the exception of headache, from which he suffered severely. He remained in this condition for about a year, when he had an attack of rheumatism, which again confined him to bed. Six months later tremor began in the head, and gradually spread to the hands and arms. It is not improbable that a distinct causal relation exists in this case between the sunstroke and the disease. In many cases, however, no factor can be elicited which has etiological value. Occasionally we find a history of apoplectiform or epileptiform attacks preceding the onset of the tremor. Nothing of the kind, however, existed in the present case, unless the reported attack of sunstroke was really of this nature.

The tremor having been once established has persisted with but little change. It is somewhat more marked than at first, and there has also been a general lessening of the strength. Our patient tells us, for instance, that he cannot walk as well as formerly,—that his legs are

weak. However, when we observe his gait we see at once there is something else the matter with it than simple weakness. He walks as though his legs were stiff. He raises his feet but little, and every now and then his toes strike or scrape the ground. In other words, his gait is spastic,—not excessively so, it is true, but sufficiently marked to be very noticeable. When I now examine the knee-jerks I find them decidedly exaggerated. This observation is, of course, in harmony with the gait; and I may say here that the spastic gait with exaggerated tendon reflexes is very commonly met with in this disease.

Examination of the cutaneous sensibility yields in this instance a negative result, though occasionally, especially in advanced cases, anæsthesia, or more or less marked impairment of sensation, may be found in the feet and legs. The patient's eyes, too, fail to reveal symptoms, though in many cases nystagmus is present and has probably the same value as the tremor of the extremities. Occasionally there is irregularity in the action of some of the muscles of the eyeballs, or there is inequality of the pupils, or even blindness. Fixation of the pupils, on the other hand, is rarely observed. Occasionally there is some peculiarity of the speech, which may become halting, jerky, monotonous, and indistinct. This is, however, not observed in our patient. Subjective symptoms are very few, and, with the exception of headache met with every now and then, pain is not complained of.

In cases that are examined post mortem a characteristic lesion is found. Foci of sclerosis are found scattered through the white substance of the hemispheres, in the walls of the lateral ventricles, in the corpus callosum, in the crura, in the pons, in the medulla, and in the cord. They are grayish white in color, somewhat more resistant than the adjacent nerve-tissue, and upon exposure to the air turn to a pinkish hue. Examined microscopically, they show proliferation of the connective-tissue elements, while the nerve-fibres have partly or entirely disappeared. It is exceedingly probable that the disease has its origin in multiple foci of inflammation in the neuroglia, and that little by little the nerve-fibres are mechanically interfered with, gradually reduced in number, and finally obliterated. It is an interesting fact to note in this connection that the axis-cylinders are preserved long after the disappearance of the medullary sheath. The location of the foci of sclerosis is not subject to any known rule, and in this respect the disease differs absolutely from systemic or tract degeneration. In the latter the disease follows the motor or sensory or other paths as the case may be, and has its origin primarily not in the neuroglia, but in the nerve-tubules themselves. It happens, however, that when in

multiple sclerosis the fibres of a patch have been completely destroyed, secondary degeneration takes place in the fibres beyond, so that we have here and there tract degenerations added to the insular disease.

Various theories have been offered to explain the tremor in these patients. Charcot supposes an impaired and irregular conduction of nerve-impulses to exist in the sclerosed areas, but it is perhaps better to admit that no specific explanation can in the present state of our knowledge be given. That the patients frequently present a spastic gait, and that the knee-jerks are exaggerated, is in harmony with the frequent interruption of fibres of the motor tract by the patches, and also with the consequent motor-tract degenerations.

Regarding treatment, I will leave you to judge for yourselves. No specific treatment is of avail. The little that can be accomplished must be accomplished by such means as maintain the general health,—tonics, a liberal diet, change of air, etc. It should be remembered that, though the disease is progressive, there are not infrequently long periods of remission, and to favor and prolong these, if possible, should be our aim and hope.

The next patient that I bring before you is a man, a sailor, sixty years of age. Last October, while in good health, he fell down the hatchway of a vessel, a distance of sixteen feet, striking upon the head and left shoulder. He is a heavy man, weighing two hundred pounds, and, as might be expected, he was much shocked by the fall. When admitted, he complained of great pain in the shoulder and back. Upon attempting passive motion of the shoulder the pain was made much worse, while the back was very sensitive to deep pressure, especially in the lower dorsal and lumbar regions. He was weak, nervous, and depressed, and sweat very freely. The point of special interest, however, in his case is that a marked tremor became established in the left arm and shoulder. This is very evident as he stands before you, and you further see that it is made slightly worse by movement. The arm also is somewhat colder than its fellow, while the hand is slightly livid.

We have here an interesting illustration of tremor following shock, or traumatic tremor. The man, as already stated, suffered from general shock, but this shock is accentuated in the left arm. This is an instance of what might properly be called local shock. The trauma has so affected—probably in a reflex way—the motor, sensory, and trophic centres that preside over the limb as to result in a general disturbance of function. This disturbance is of course in the direction of depression: it is an expression of local weakness. This is illus-

trated first by the marked diminution in the power of the grip; secondly, by the tremor; thirdly, by the evident loss of temperature; and fourthly, by the loss of tone in the vessels, as evidenced by the lividity. The pain on pressure on the back and also here in the neighborhood of the shoulder-blade is indicative of severe ligamentous and muscular sprain.

How shall we treat a case of this kind? Evidently rest is the first essential of treatment; and secondly, gentle massage of the arm and shoulder, and, later on, faradic electricity. The tendency to chronicity in a case of this kind is shown by the fact that these symptoms are still very marked, upward of four weeks after the accident.

The third and last patient I have to show you is likewise one who presents a traumatic tremor. The history of the case is as follows. G. T., aged forty-six years, single, and an upholsterer by trade, was in good health up to October 22, 1890. On that day he was sitting on the rail of the South Street bridge. His hat blew off, and, letting go his hold upon the rail to catch his hat, he lost his balance and fell a distance of thirty feet upon a mound of earth. He struck upon the back and head, became unconscious, and remained so until he found himself in the University Hospital, to which he was removed on the same day. He was at first very much confused, and suffered intensely from pains in the back and head, and his entire body seemed to tremble. On October 27 he was transferred to our nervous wards here. When first seen by me he walked into the office of the nervous pavilions. He walked without assistance. He seemed, however, weak, and his steps were evidently shorter and slower than normal. He stripped himself to the waist without help. He complained of pain in the lower dorsal and lumbar regions, and deep pressure there revealed great soreness. Marked pain was also elicited in this region by bending the trunk forward and backward and to either side, and also by rotating the upper portion of the trunk on the lower, the hips being firmly held by an assistant. Further, if, while he was standing erect, a mild blow or push were sent from the top of his head down the spinal column, he would also give evidences of great suffering. Marked spasm of the muscles of the back was also noted in the lower dorsal and lumbar regions during attempts at movement. In addition, there was marked and uncontrollable tremor of both arms and shoulders. He also complained of headache, and seemed much depressed.

He was at once placed in bed on the "rest cure." Milk in as large quantities as he could take was given, and for a time massage was attempted, but this, owing to the painful condition of the back,

had to be abandoned. However, instead of improving, his symptoms steadily increased in severity. His back became more and more painful. The muscles soon attained a condition of almost constant spasm, and as a consequence the back grew very rigid. In addition, the back also became very sensitive to even very slight touch. Excessive sweating also set in gradually, and tremor became more pronounced than ever. Four weeks after admission only did his symptoms attain the maximum of their severity. The man was now thoroughly and abjectly miserable. He was excessively depressed, cried easily, complained of headache, said that he could not sleep, dreamt sometimes that he was again falling from the bridge, heard the ringing of bells and hissing noises in his ears, trembled worse than ever, had difficulty in passing water, and frequently had sharp pains shooting through his back and head, and even in his abdomen. In addition, there was now decided loss of sensation in both feet, and he was utterly unable to stand. His weakness was extreme. Sweating was excessive, the bowels were constipated, and the knee-jerks much exaggerated.

As the man lies upon his side with the back exposed, you are at once struck by the unusual prominence of the muscles. His muscles are not naturally very large, but at present they stand out like cords. Touching them, we find that they are very hard, and, in addition, very painful. Everywhere the back is exquisitely sore, but especially in the upper lumbar and the lower dorsal region. You just saw me touch him, and now I show you my hand. You see that it is quite wet. The man is sweating profusely. Looking at his countenance, you see how anxious and drawn it is,—how expressive of suffering. See how he trembles! The slightest movement provokes tremor, not only of the arms and hands, but also of the entire back.

When he speaks, you notice that he does so with difficulty. He talks in a short and jerky manner, as though it gave him pain in the back. It evidently causes him considerable effort, and tires him very much. Whether there is here a psychic element at play, or whether the effort causes the spasm to radiate to the chest-muscles and diaphragm, it is impossible to say. The latter view, however, seems to be the more probable.

What has been the injury in the present case? Evidently there has been no fracture and no dislocation. There can be no doubt, however, that there is here a deep-seated injury, one involving the ligaments of the spinal column, or the muscles, or probably both. Practically, it is impossible to distinguish between the injuries of these structures, nor is it important. We should remember, in thinking of

the muscles, that they are normally in a state of tension, especially when the trunk is erect. Indeed, the physical condition presented is that of a bow with many strings. It is not difficult to understand how under these circumstances jars and blows should cause serious though perhaps minute strains of the muscles, especially at their tendinous insertions. In other words, we have here an instance of badly-sprained back. The muscular spasm and rigidity are to be accounted for in the same manner as the muscular spasm observed in a sprained, a dislocated, or a broken leg.

In addition to these symptoms of physical injury we have symptoms indicating that the man has suffered severely from shock. We have great weakness, tremor, sweating, inability to properly expel the urine, mental inertia, tinnitus, etc. This condition is now spoken of as traumatic asthenia or neurasthenia, but I for my part fail to see that this is an improvement on the term used by the older surgeons,—namely, chronic shock. Certainly the old term is far more expressive. The mental depression is, perhaps, what we should expect under the circumstances.

An interesting problem presented by this case is, why the symptoms did not attain the maximum of severity until several weeks after the accident. It seems to me exceedingly probable that there was here a direct extension of inflammation from the original site of the trauma along the sheaths and tendons of the muscles. It is difficult to escape from this inference, inasmuch as there was a marked spread in the area of pain on deep pressure. Hand in hand with this, there was beyond a doubt a radiation of the muscular spasm, not only to the immediately adjacent muscles, but even to those of the shoulder and abdomen.

What is the future of this patient? That is something I cannot answer. He is evidently a very badly injured man, and judging from the time that has already elapsed, some four months, it is probable that early recovery will not take place. The chances are, however, that he will eventually improve, though this improvement will be very slow and gradual. Whether complete recovery will take place I cannot say. I regard it, however, as improbable. It is not unlikely that after the lapse of months and years traces both of the injury and of the shock will be left.

This case is especially interesting because the injury closely resembles those which are so often received in railway accidents. Indeed, this case is, properly speaking, really an instance of a "railway spine," and doubly interesting because of the absence of all litigation.

EPILEPTIC INSANITY.

CLINICAL LECTURE DELIVERED AT THE HOSPITAL FOR THE INSANE.

BY GEORGE L. SINCLAIR, M.D.,

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GENTLEMEN,—By epileptic insanity we mean that form of mental derangement in the antecedent history, in the manner of invasion, and in the further development of which we recognize an intimate connection with the epileptic neurosis. Only a small number, comparatively speaking, of epileptics become insane, and the mental derangements of these may assume the form of maniacal excitement, of mental depression or enfeeblement or dementia, of delusion, perversion or perversions of the moral being. Any one or more of these states may be revealed by the patient. Ordinary epilepsy is more common in the female sex, but at this time, of our total cases of epilepsy, only a small fraction are females. The periods marking the occurrence of puberty in the male and the establishment of menstruation in the female—say, between thirteen and sixteen years of age—are especially dangerous in the lives of patients who have a neurotic ancestral taint. An hereditary taint of epilepsy or insanity can usually be traced in one-third of the cases, and about one epileptic in ten is liable to be a sufferer from epileptic mania. Leaving out hereditary and traumatic causes, fright in persons under ten years of age and excessive mental worry in those who are older are the commonest exciting causes. It is a difficult thing, though, to trace the cause of the first fit. The public have a dread of acknowledging any predisposition either to epilepsy or insanity, and regard an ancestral weakness in either of these directions as something akin to disgrace. Cases beginning in infancy usually are assigned to the irritation of teething, and of late years eye-strain in both children and adults has come to the front as an exciting reflex cause. No matter what the cause, the disease is very serious and the prognosis unfavorable.

Books usually class epilepsy among the functional nervous diseases. If the pathological investigations of Bevan Lewis are correct, there is an anatomical lesion. Those thus far seen as gross changes in the

brain and its membranes are as likely the results as the causes of epilepsy. Bevan Lewis, by microscopic investigation, finds evidence of degeneration in certain of the brain-cells of the cortex. The cells of the second layer, characterized by the large size of their nuclei, and to which he assigns special inhibitory powers, undergo changes and their nuclei are removed by fatty degeneration. To this the term vacuolation is applied. The ganglion-cells of the fourth layer, which he regards as especially motor in function, are also degenerated, readily parting with their nerve-force, of which they appear to be reservoirs, and which, owing to the loss of control from the changes in the cells of the second layer, is delivered as a "sudden, rapid, excessive, and occasional discharge," constituting the phenomena of the disease. I think that the view so long advocated by Hughlings Jackson, that epilepsy is the result of such an explosion of nerve-force occurring in the cells of the cortex of the brain, is now generally believed. For a long time the theory advanced was that known as the vaso-motor, by which was meant that the loss of consciousness and the convulsions of epilepsy were the result of vaso-motor excitement causing spasm of the cerebral arteries and sudden anæmia of the brain. We still acknowledge that cerebral anæmia can have such accompaniments, but we do not think that the assertion that the brain is anæmic when a convulsion occurs can be proved. Pallor of the face no more indicates this condition than suffusion the opposite state. With all the knowledge that has been accumulated of late years, I think we need have no hesitation in accepting as fact that an epileptic seizure is the result of a sudden, rapid, and excessive nervous discharge, and the recent investigations of Victor Horsley limit this discharge to the cells of the cortex, and show that a condition of congestion, not anæmia, exists at the time. Among the insane this discharge is attended with an expenditure of force out of all proportion to the normal physiological outlay, and wholly inconsistent with the continued healthy activity of the parts concerned. It may occur in any part of the brain; may begin in one and spread to other regions, and so may give an almost endless variety of motor or sensory effects. The general division of idiopathic epilepsy is into major and minor attacks, or the petit mal and grand mal. In the former, motor effects are less evident than sensory; hence this variety of the disease is more dangerous to mental stability than the grand mal and is more apt to be followed by insanity. Grand mal in epileptic insanity is usually very severe and the convulsions are terrible to witness. For the last year, on the male side of this hospital, the insane epileptics have been gathered into one ward. They are a class with many objectionable

traits. They need special supervision day and night, and we can carry this out best under our present plan. We have a night nurse for this ward, and we feel sure that under our existing method the best interests of the patients and the house generally are subserved. We have only three female epileptics and eleven males. Their ages range from nineteen to sixty years, and their appearance varies from that of simple indifference and dementia to that of any ordinary man. Their physical condition, as a rule, is good. Some are robust, healthy-looking men. Two of them are hemiplegic. In one case this condition antedates, in the other (a case with an hereditary history of insanity and epilepsy) it has post-dated his epilepsy. In some, marks of old injuries about the face, caused by the fall in the beginning of the fit, are to be seen. A woman's nose is flattened down and her forehead is bruised, as she always pitches forward with great violence, striking that portion of the head. I have seen cases of *petit mal* free from occasional attacks of *grand mal*. Here is the history of such a case.

G. N.—She is thirty-five years of age, has been an inmate here for four years, and was sent because she was subject to violent outbreaks of temper, during which she committed several serious assaults, of which she afterwards said she had no recollection. She had not been seen to have any kind of fit, though at times she was said to be dazed. There is a family history of insanity, none of epilepsy; her mental development is poor, and she is duller and more stupid now than when she came in. Shortly after her arrival, during my visit to the ward in which she was, I noticed her engaged knitting, walking about while at work. Suddenly she dropped her work, ceased walking, and looking at her I noticed her face was pale, the muscles of the left side twitched, her pupils dilated; then the face flushed, her hands were raised, and before she could be checked she nearly succeeded in removing her clothing. In a few seconds she started forward, her pupils contracted to normal size, she drew a long breath, looked around in a startled and surprised way, regained possession of her knitting, and recommenced work. The whole attack scarcely lasted as long as I have taken to tell it. I gave special directions to the attendant to note the recurrence of such symptoms. She said that she had seen her often in the same state, and that sometimes, instead of unbuttoning her clothes, she would take off a slipper and strike savagely at any one within reach. She volunteered also the information that when spoken to regarding her acts she denied having committed them. This was a case of *petit mal*, but did not continue as such, for a few days afterwards I was summoned to the ward and found her in a typical attack of

grand mal. Her seizures have continued ever since. There is no regularity, but almost every day she has several attacks of petit mal and much more rarely of grand mal.

As illustrating the grand mal variety, with fright as an exciting cause, we have a patient, an Indian lad, nineteen years old. Five years ago he was very much frightened by seeing a man fall from a canoe and, before aid could reach him, drown before his eyes. Several weeks later he had his first attack of epilepsy. His seizures increased rapidly in number, and of late an attack of epileptic mania has followed each set of seizures. He has intervals when he is free from fits, but at other times he is so violent that he has been sent to us for treatment. He is rapidly deteriorating mentally, and we see no improvement in the variety or the severity of the fits or the after-effects. Another similar case is a man, of thirty-four, who when ten years of age was attacked by a dog and very badly frightened. Some time later he had an epileptic seizure, and ever since, at intervals, the fits have returned. He has developed at times much violence, both immediately before and after the attack. In his case there is no history of ancestral taint.

Another man, aged fifty-three, who has been a patient here for many years, has attacks of grand mal occurring almost always at night, or rather towards morning. A series of epileptic fits is succeeded by a maniacal condition lasting from a week to ten days. During this he is noisy, abusive, and very violent. He says he has no recollection of what he has done when he gets better. He is a strong, robust man, a religious bigot, and, even when comparatively well, a complaining, fault-finding, hypochondriacal patient.

The usual phenomena observed in ordinary epilepsy are present in our patients. First the cry, which varies from a moan to a shriek, then the fall, with tonic spasm and cessation of respiration, succeeded in a few seconds by clonic spasms, which begin as tremors or twitchings and rapidly pass into violent jerks, champing of the jaws, escape of froth—often bloody—from the lips, and an involuntary passage of urine, more rarely of feces; then a gradual restoration of normal respiration, a lessening of the jerks, and, when they cease, a look of vague dread in the face, a feeble effort to get up, ending in the patient's falling back and going to sleep for a varied length of time. The face is usually bathed in sweat, and frequently this is strongly odorous. After the sleep the patient may appear merely stupid, or go into a state of automatism or of mania of variable duration, or resume the ordinary condition which existed before the seizure. There is apt to be a periodicity in the occurrence of the fits. Our night nurse thinks

that they are worse during the increase of the moon ! The number of fits occurring during a period varies from two or three to many more. The Indian lad will sometimes have ten or twelve in twenty-four hours, and this will continue four or five days and nights. During the last year he has had at night three hundred and twenty and during the day one hundred and fourteen fits.

In some cases also the status epilepticus may set in,—a most serious condition. In it the convulsions recur with no interval of consciousness, the temperature rises as high as 106° or 107° F., evidences of pulmonary complication appear, and the patient is apt to die.

I had a man here who died in this state after having had three hundred and sixty-five fits in twenty-four hours. Towards the end they were less severe, till finally they seemed more of the nature of spasms than pronounced convulsions. The fits are not always followed by acts of violence. In some cases they seem actually to result in calming the individual, clearing the mind by a nerve-storm as we see a thunder-storm clear the atmosphere on a murky summer day. Attendants learn this, and will tell you, in speaking of some patient who is specially irritable, "Oh, he is going to have fits, and will be all right after that." While many of our patients have certain premonitory symptoms preceding the epileptic seizure by longer or shorter periods, a distinct aura cannot often be discovered. Perhaps the mental condition prevents them appreciating the meaning of my question, or prevents them explaining such sensation if it occurs. The premonitory signs occur frequently as peculiar sensations in the head, discomfort or actual pain, or in the digestive tract a feeling of fulness or an attack of diarrhoea. Marked change of ordinary disposition is frequently seen. In rare cases it takes the form of hilarity, excessive talkativeness, or unprovoked laughter. As a rule, though, in my experience, there is irritability, moroseness, attacks of unprovoked violence upon any one within reach, complaints of ill treatment and of being unfairly dealt with.

In one of our patients there is an aura. He says just before having a fit he feels his stomach distend, that the wind passes to his brain, and he remembers no more. A woman, now dead, had a visual aura. She saw a red light over her left shoulder. When first seen it was not larger than her fist. It approached rapidly, growing larger, and finally a figure of a woman emerged from it, who struck her on the head and she became unconscious. One of our men is much troubled for hours before a convulsion occurs with auditory hallucinations. He hears people calling him, threatening to shoot him, and he

becomes furiously pugnacious in his efforts to defend himself. A peculiarity which we see is a marked exaggeration of religious feeling. One of our men spends hours on his knees reading his prayer-book or Bible, but his religion is false and utterly lacking in the charity of which St. Paul spoke. He is a bigot of the worst kind, and classes the members of other sects in the same category as the devils who later on persecute him. There is in these people also an inclination to exaggerate their pains and aches, giving rise to a marked condition of hypochondriasis. Every little symptom of physical discomfort is enlarged and dwelt upon. No doubt they do have some of the ills of which they complain, but it is their mental state which causes them to regard these trivial or serious symptoms as the most terrible that mortal man or woman was ever called upon to endure.

Another peculiarity commonly seen among the insane epileptic is a marked inclination to steal. We have one man who will take anything he can lay his hands on, and even strip his fellow-patients of various articles of clothing and devote them to his own use. This brings me to still another feature in the histories of sufferers from epileptic insanity: that is a propensity to lie. It may take the form of simply denying their own acts, or of making false charges of various kinds against attendants or fellow-patients. Of course I do not mean that they knowingly lie, but they imagine things which have never occurred, or they misconstrue those that have, and in either case draw wrong conclusions, which they assert, believing them to be facts.

Finally, I would refer to the acts committed by epileptics while in the unconscious stage of epilepsy, or the automatic condition which succeeds it. These acts are of great importance from a medico-legal stand-point. I have seen patients walking about the wards, avoiding obstacles, picking up and secreting articles, and yet perfectly unconscious of what they were doing, and then falling in a fit. At times an amount of apparent premeditation exists which makes it difficult to believe that the act or acts are involuntary or not deliberately planned. The epileptic is very sly, and often keenly alive to the fact that if charity covers a multitude of sins, insanity covers them all, as a lunatic of this class once informed me. The automatic acts after a convulsion vary greatly as regards their variety and harmlessness. They are a very dangerous feature in the disease, and some of the most diabolical crimes have been committed by epileptics in this state,—such crimes, of course, being far more apt to occur outside than inside the walls of a hospital. It has been noticed, too, that the act or acts, the ideas, delusional or otherwise, prevailing at the preparoxysmal stage are

likely to become operative in the post-epileptic automatism. Even words and expressions used immediately preceding a seizure are repeated immediately after. Time will not permit me to dwell longer on this subject, but I would like to say that, in observing the symptoms in epileptic insanity, we must guard against allowing the things which are seen to distract our minds from the careful study of those that are unseen. A characteristic of the disease in lunatics is the brutal nature of the discharge of nerve-force. We can see this in the violence of the visible motor disturbance. How can we tell how much destruction of will-power occurs if the discharge originates in the sensory region or spreads from the motor region to the sensory? Motor convulsions are an objective sign, involuntary movements or convulsions are also plainly visible, but not so with the sensory effects of a nerve-discharge. Why should this not paralyze the higher, restraining mental functions, and allow the substratum of brutality to take possession of the man? Undoubtedly this happens; and I endeavor constantly to impress upon those who have charge of our epileptic patients that, no matter how premeditated a wrong act appears, it is probably just as involuntary, quite as much beyond the control of the patient, as are the convulsions which they witness in the muscular sphere; that both, in fact, are due to the same cause, and both are part and parcel of the general cerebral instability of the sufferer.

I can only allude to two other interesting phases of epileptic insanity,—what are called the inter-paroxysmal states and the medico-legal aspects of the disease. As regards the first, the mental condition after the ending of a series of seizures and before the beginning of the premonitory symptoms of another series—the duration of which state varies in different cases—also varies greatly. Some few patients recover what may be called a perfectly normal condition of mind. No intellectual or emotional change can be detected, and they are quite capable of correctly performing their ordinary work. A stranger seeing such a case at this time would wonder why it was in an asylum. It is because of their instability, because there are periods in their lives when to have them at large would mean danger to themselves and others. We had a patient here who during this period was a valued contributor to the press, and whose articles upon the live questions of the day showed unusual keenness of intellect, and yet who at times became homicidal in his vicious propensities. There are others who recover a degree of their former mental vigor, but who continue to harbor delusions, or whose emotional sphere is never evenly balanced. Another class, comprising the most objectionable and the most danger-

ous lunatics with whom we have to deal, exhibit throughout these intervals strong intellectual perversion. Their passions are always rife, and upon the least provocation they are guilty of acts of desperate violence.

Finally, there are the epileptic demented in whom there appears to be nothing left of the higher nature, whose only desire in life is to gratify the lowest and most brutal passions. They are perhaps the most repulsive people with whom we come in contact. There appears to be no rule that can be laid down as to what the effect of epilepsy will be upon the intellectual life. One thing only appears to be certain,—that this form of mental disease is practically incurable.

As to the medico-legal aspect, it is most interesting, because epilepsy is a disease liable to exist among the criminal class, and among these to evolve an impulsive form of insanity in a nature already degraded. How far does the existence of epilepsy render its subjects irresponsible for crime? This is a difficult and delicate question. The disease has no uniform series of symptoms, and there are various degrees of mental impairment among its victims. As I have said, some patients have practically no defects except immediately before and after their seizure. I see no reason why such should not be held responsible for crimes committed in their lucid intervals. We must not assume, because a patient is epileptic and has at times mental disturbance, that he is necessarily irresponsible for his acts in the intervals between his attacks. The proximity of a wrong act to a seizure favors the idea of mental impairment at the time of commitment, but we must always remember that the mental disturbance following a fit is different in different cases. If we are asked if a man who is perfectly sane a week after a fit can be irresponsible for an act committed a day after a fit, we can say, "Yes." Suicidal and homicidal acts are committed subsequent to epileptic seizures, as the result of automatism or as an uncontrollable impulse without motive, or during the fury of epileptic mania or instigated by the promptings of a deluded mind. I have already referred to the automatic acts of the epileptic. Their impulsive acts are like explosions, and, being dictated by a leading idea, brook no denial. Sometimes epileptics realize this, and will ask to be put under restraint, so as to prevent the committing of acts which they feel powerless to resist. An impulsive act has not only great suddenness, but generally an entire absence of motive. Finally, if crime seems due to a deluded mind, we may find that the delusion existed prior to the epileptic attack, and was acted upon after the fit and before consciousness was fully regained. Bevan Lewis says,—

"In deciding the question of responsibility we should ask ourselves,—

"Was the act characterized by complete automatism?

"Was the patient sufficiently conscious to recognize its nature?

"Was he sufficiently conscious to recognize its criminal nature,—that is, the distinction between right and wrong and the probable issue?

"Or, if the latter was the case, was it the outcome of insane delusion or perpetrated as a purely uncontrollable impulse?"

But remember, epilepsy is sometimes feigned, even to the extent of actually inflicting personal injury by falling in some public place. By the professional eye, in time, the fraud would be detected. The phenomena of the seizure cannot all be assumed, even by the most expert actor. The pallid face, the dilated pupil, the clonic spasms, cannot be simulated. Still, when a criminal, possibly accustomed to associating with genuine epileptics, assumes the character of epileptic insanity, it is very difficult of detection. Epileptics are very sly and cunning, and have been known, as a means of obtaining some privilege or indulgence, to act a condition of mind not actually present. Watchful, intelligent supervision, extending over a considerable period of time, is the only means of deciding in some cases the genuine from the false.

The prognosis of epileptic insanity is uniformly bad. I never knew a case of mental recovery occur. In speaking of prognosis, we must bear in mind that we refer to the chance of recovery from the epilepsy and not the duration of life. Epileptics are frequently long-lived, especially if they are so placed that the danger of accidental death is reduced to a minimum. Barring such accidents as drowning or suffocation, with good care, life is frequently prolonged to a ripe old age.

Now as to treatment. Our object should be, if possible, to lessen the number of fits, to control the violent symptoms, to maintain the general health, and to guard against accident. The bromides, notably that of potassium, are the remedies from which we have the best results in the first indication. I think, given twice a day, in doses from twenty-five to forty grains in plenty of water, bromide of potassium is the best treatment. It is a drug which is slowly eliminated and does not rapidly produce its effects. We combine it with tincture of digitalis or liquor arsenicalis when the tendency to produce acne is very decided. We are now trying the combination of antipyrin and ammonium bromide in certain cases. We cannot yet speak definitely as to its effect. The coal-tar series—phenacetin, antipyrin, or acetanilide—have not acted well with us. For the status epilepticus, chloral in large doses is useful.

Nothing in my hands has succeeded so well as morphine sulphate, grain one-third, by the skin. For controlling the violence, I think seclusion, with hyoscine hydrobromate, grain $\frac{1}{120}$, the best treatment. The greatest good of the greatest number must be studied, and an impulsive insane epileptic is a danger to friend and foe. Sometimes tincture of cannabis indica and bromide of potassium act well as calmatives. Epileptics are frequently large eaters. I reduce their diet, especially in the matter of animal food. This is a very important point. An occasional purge of pulverized jalap and calomel does good. Milder aperients should be used to overcome constipation. Fresh-air exercise is very desirable and should be insisted upon. Employment in the garden or field is serviceable in suitable cases. At night epileptics should sleep in a ward with a special night nurse, who should visit them frequently and be prepared to prevent such an accident as suffocation during a fit, report the number of fits, and generally look for and guard against accidental or intentional injury. Finally, an examination of the eye should be made with reference to defects in that organ or its appendages, and if such are found they should be remedied by the proper treatment. Still, I never regret when our population is reduced by the death of one of these people.

THE PATHOLOGY AND SURGICAL TREATMENT OF NEURALGIAS OF THE FIFTH PAIR, AND THE CLINICAL PECULIARITIES OF SUPRA-ORBITAL NEURALGIA.

CLINICAL LECTURE DELIVERED AT THE MASSACHUSETTS GENERAL HOSPITAL,
BOSTON.

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GENTLEMEN,—Following the intention expressed in a previous lecture, I shall speak a little further on the interesting and important subject of the neuralgias of the fifth pair by dwelling somewhat more at length upon three points,—viz., their pathology and pathological anatomy, their treatment by operation, and the peculiarities of the neuralgias of the first division of the fifth as compared with those of the second and third divisions.

As regards the matter of pathology, the amount of literature is small and the actual facts at our command are practically the following: Degenerative and inflammatory changes of various kinds have been found in a number of excised nerves, and the histological appearances described by Schweinitz, Horsley, Dana, Rose, and myself. These changes are liable to affect in varying degrees the nerve-fibres themselves, the connective tissues, and the blood-vessels. As regards their origin, that is still a matter of question, and probably varies greatly for different cases. The history of a case frequently suggests that the nerve-filaments have suffered some injury at their peripheral ends, as from the disturbances of the teeth, of the dental canal, or of the mucous membrane of the eye; but Professor Rose,¹ of London, who has written the latest work upon this whole subject, says that he has found chronic interstitial changes in the nerve-ganglia, and to these

¹ London Lancet, January 9, 1892, *et seq.*

the changes in the nerve-fibres might readily be secondary. The thickening of the blood-vessels has been dwelt upon by Professor Dana, of New York, and in a recent communication by myself. A general thickening of the arteries was also found in the whole area of a supra-orbital neuralgia by Thoma, whose opinions on this subject are especially valuable, as he has made a special study of vascular diseases. Dr. Dana thinks that the vascular affections are the most constant, and in many cases probably the primary change, and failed to find evidence of nerve-degeneration in most of his cases, and it was wanting in some of mine. On the other hand, a long-continued congestion is liable to cause arterial disease, and in this way the thickening might be secondary to the vaso-motor changes which so often complicate neuralgic attacks. It might, also, be secondary to the nerve-degeneration, as forming a part of a substitutive sclerosis. Even if this be so, we have obviously a vicious circle, for, however initiated, the disturbance of circulation brought about through the arterial disease would be certain to impair the nutrition of the nerve, and make it fall a prey more readily to degenerative or toxic influences. I say toxic, because it is quite possible that when the peripheral nerve-fibres are injured by disease of such organs as the teeth or the eye, toxic materials are introduced within the nerve-sheath which cause an extension of the neuritis upward. The same explanation has been offered for the progressive and intractable neuritis of the stump after amputations, and Horsley adopts it as accounting in part for the return of the pain after operations on the fifth nerve, an outcome which more perfect aseptic precautions might perhaps prevent. It is highly probable that one prominent cause of disease of the fifth nerve, and one which at the same time explains its more frequent occurrence in advanced years, is that the bony canals through which the nerves pass are liable to become obstructed or narrowed to a greater or lesser degree. In a similar way, exostoses are liable to form in the neighborhood of the Gasserian ganglion.

My own view as to the pathology of these neuralgias is that we usually have to reckon with disease both of the nerve-centre and of the nerve itself. It is the disease of the nerve-centre (not necessarily gross disease) that gives each neuralgia its peculiar characteristics; it is the irritation coming from the diseased nerve that keeps the nerve-centres in their abnormal state. Either one of these conditions may have been the cause of the other,—that is to say, the simple occurrence of what has been termed “nerve-storm” is liable to set up changes in the peripheral nerves, and, on the other hand, irritation of the periph-

eral nerves is liable to set up typical neuralgias, especially in persons predisposed to them. It may be of interest, in connection with this question of pathological anatomy, to show some plates illustrating some observations of my own.

Fig. 1 represents the almost complete conversion of the nerve-bundle into nucleated wavy connective tissue. The section is cut obliquely, so that *A* represents a longitudinal portion and *B, B* transversely cut portions. Altered nerve-tubes are here and there to be seen. The sheath of the nerve is thickened.

FIG. 1.

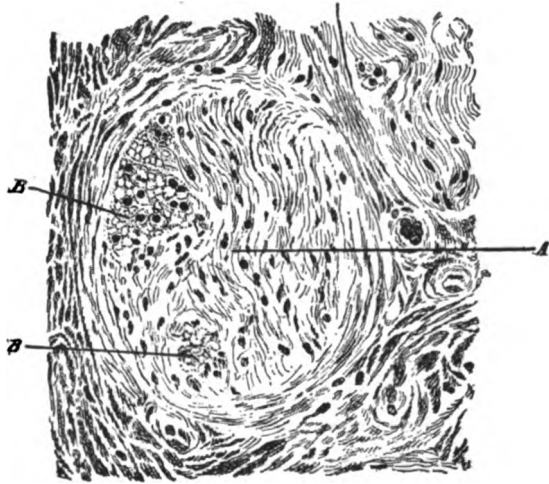


FIG. 2.

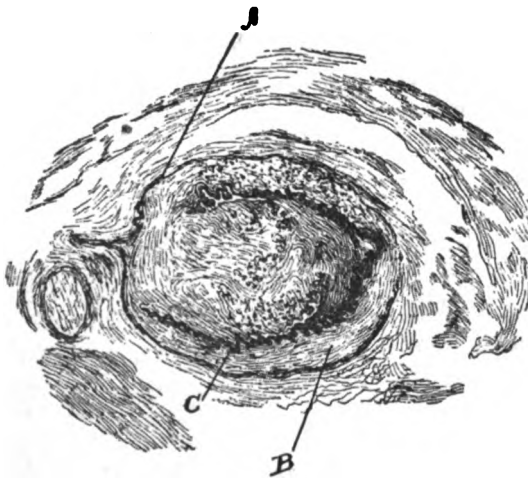


Fig. 2 represents an obliterated artery from the connective tissue surrounding the nerve and forming its sheath. *A*, external limit of the artery; *B*, muscular coat of the artery; *C*, fenestrated mem-

brane. The mass forming the centre is fibrillated and contains a number of nuclei, and is continuous with the remaining coats of the artery at the left-hand side, where the fenestrated membrane seems broken through; also at other points. Other arteries in the neighborhood of this one, all of them of large size, are in a similar condition.

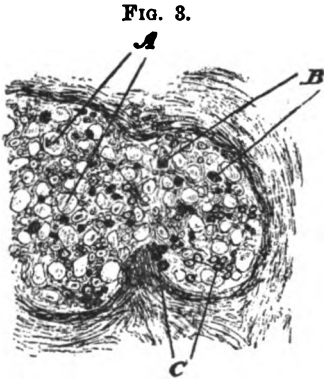


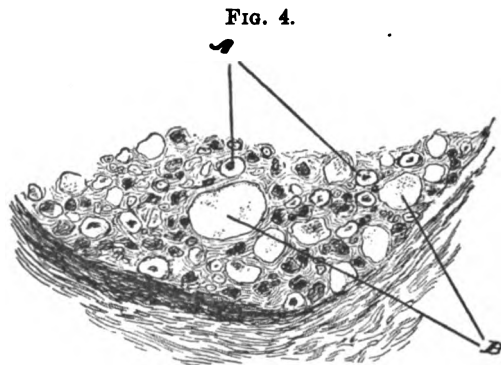
Fig. 3 represents nerve-tubes of larger (*A*) and smaller (*C*) size, giving to the section a strikingly-mottled look. The large tubes are of several times the normal diameter, and are filled with a granular substance, sometimes with and sometimes without the remains of altered axis cylinders. The small tubes are apparently perfect in structure, and

may possibly be newly-formed fibres. Between the nerve-tubes are large numbers of nuclei (*B*).

Fig. 4 is an enlarged view of a portion of No. 3. *A*, normal nerve-fibres; *B*, altered nerve-fibres. Numerous nuclei occupy the space between the fibres.

Fig. 5 is a portion of the external sheath showing the relation of small nerve-fibres (*A*) to the blood-vessels. Many of the fibres of these small nerve-bundles seem to have been destroyed and their places taken by connective tissue. It seems not improbable that the force of the blood, beating against the altered nerve-fibres lying within the sheath, is a prominent cause of pain. This view is endorsed also by Rose.

As regards the next point,—the treatment of these serious neuralgias by operation,—I wish only to emphasize what I said in the previous lecture,—viz., that the progress of surgery has made it possible to use this treatment with great success and with comparatively little danger; so that it is a mistake, in most cases, to postpone it until the patient has been weakened by prolonged suffering and



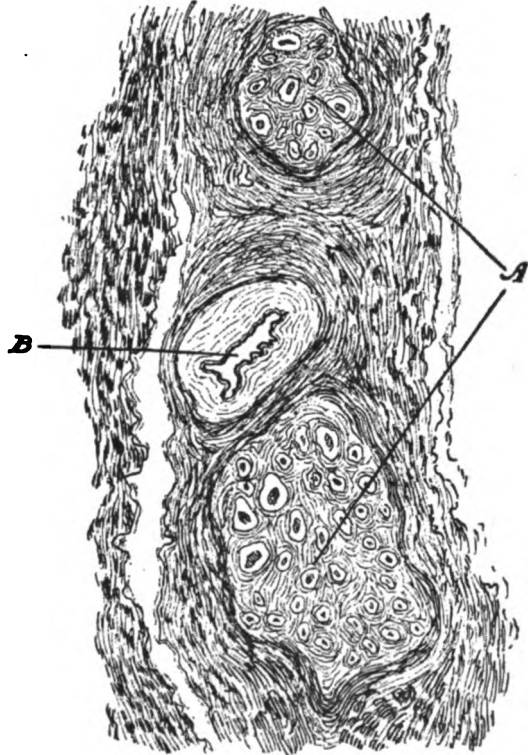
the use of powerful anodynes. Furthermore, it appears that the deeper operations give much more lasting results than the superficial operations. The recent observations by Rose and Horsley, to which I have several times alluded, fully bear out this view. By deep operations, I mean the section of the second and third divisions at the foramen rotundum and ovale, the avulsion of the nerves after section, and the operations on the Gasserian ganglion and main nerve-root.

The experience of surgeons in this neighborhood with regard to the sections at the foramina is well indicated in a paper by Dr. S. J. Mixter in the *Boston Medical and Surgical Journal* for August 13, 1892. Similar operations have been done by surgeons elsewhere, and a considerable number also at the Massachusetts General Hospital since the date of Dr. Mixter's paper. Only a few mis-

haps, and those not of a serious character, have followed the operation itself, since the introduction of antiseptic methods. In two or three cases there was rather long-continued suppuration, and in another a partial ankylosis of the jaw which persisted a year after the operation. I may add that a patient of mine who was successfully operated on by Dr. Richardson, some years ago, by the intra-buccal method, for section of the third division, had a curious and annoying lisp in her speech afterwards, which made the pronunciation of certain letters very difficult. This gradually wore away to a great extent, but persisted somewhat at the end of three or four years.

Within the past few years several surgeons have removed the fifth pair even farther back than at the point of exit from the skull. Pro-

FIG. 5.



fessor Rose¹ has five times trephined the skull and wholly or partially removed the Gasserian ganglion; and Andrews has done the same successfully in two cases.² In one of these cases, as also in one of Rose's, ulceration of the cornea followed the operation. I find a reference to a similar operation by Lamphear.³ The second and third divisions of the fifth nerve have also been removed within the cranium by Hartley,⁴ and Horsley⁵ has divided the fifth nerve-root on the proximal side of the ganglion after trephining away a good part of the squamous portion of the temporal bone. The patient on whom this operation was done was at the time in a very poor condition, and did not survive the shock of the operation. Horsley's reason for this procedure was that experimental investigations and dissections had led him to believe that the Gasserian ganglion could not be wholly removed without great danger of rupturing the wall of the cavernous sinus, close to which it lies.

I will not assume to judge between the merits of these different operations. The section at the foramina is usually sufficient, but if the nerve should become inflamed within the skull, and therefore the pain return, it is important to bear in mind that we have the severer operations to fall back upon.

It is true that under the influence of certain kinds of treatment, as by aconite in large doses, and even spontaneously, these neuralgias are liable to disappear for a shorter or longer period, and this is sometimes considered to indicate that no pathological condition of the nerve is present which could be influenced by operation. This, however, is not the case. These periods of arrest are curious phenomena, probably indicating that for the production of a neuralgia not only a peripheral irritation but also a morbid state of the nerve-centre is necessary. The peripheral irritation, though it continues, may fail to keep up the pain. Pain, however, is in most cases certain to return.

Finally, I wish to fulfil a promise made in an earlier lecture, to say something more of the peculiarities of the neuralgias of the first division of the fifth. These neuralgias show a peculiar tendency to periodical recurrence, and this, too, even when they seem to have been initiated by peripheral irritation, especially by inflammation of the frontal sinus, which is their most common peripheral cause. Again,

¹ London Lancet, January 9, 1892, *et seq.*

² International Medical Magazine, 1892, vol. i. p. 479.

³ International Journal of Surgery, 1892, vol. v. p. 148.

⁴ New York Medical Journal, vol. lv. p. 817.

⁵ British Medical Journal, 1891, vol. xi. p. 1189.

these intermittent neuralgias of the ophthalmic division of the fifth occur often in the families of persons subject to migraine and periodical headaches, and sometimes in connection with migrainoid headaches. I could easily give a number of cases to illustrate these points, but I will refer only to two or three. The first is that of a family in which these supra-orbital neuralgias have been present for several generations, although the individual headaches have rarely occurred except in consequence of some especial peripheral or general cause, usually catarrh of the frontal sinus on the affected side. Several members of this family have also suffered from abortive migrainoid headaches, as indicated by hemiopic disturbances and slight headaches. In spite of this fact, which, taken in connection with the hereditary tendency, would seem to indicate a central cause for these typical periodical neuralgias, evidences of actual neuritis have been perfectly marked in one member of the family, consisting in periosteal thickening in the affected region, crops of minute painful papules at times, and a permanent impairment of the accommodation of the eye on the affected side. The attacks of neuralgia, when they have occurred, have been of one or two weeks' duration, the pain coming on every morning at eight or nine o'clock, and subsiding in the early afternoon, perhaps to recur again slightly towards night.

In another case which I have recently seen, a man otherwise healthy, except that he and other members of his family have suffered from sick headaches, had his first attack of supra-orbital neuralgia in a severe form about two years ago. The exact characteristics of that attack I do not know, but the pain was so severe that it was thought best to resect the supra-orbital nerve, and the fact that this was followed by long-continued relief seems to justify the assumption that peripheral irritation was present. For the last six months he has been suffering from a recurrence of the same trouble, but now the headaches are distinctly periodic and of migrainoid type, occurring once a week and lasting for twenty-four hours.

In some journals of older date I have seen references to cases where patients had recurrences of this form of neuralgia regularly every year, usually in the autumn, the individual attacks continuing with daily remissions for about two weeks.

Finally, I would refer to the case of a lady, long under my care, who was an excessive sufferer from migraine, and presented other strongly-marked neurotic symptoms. During her attacks the supra-orbital nerve-district and sometimes the trunk of the nerve itself would frequently become tender.

What I have said of the supra-orbital nerve is true also, although to a far less degree, of the occipital neuralgias, which often associate themselves, usually by extension, with those of the supra-orbital region.

This peculiar tendency of the supra-orbital neuralgias to occur periodically has gained them the name of the *brow ague*, although it is quite doubtful whether they are ever of malarial origin; certainly this is not always the case.

It will thus be seen that these supra-orbital neuralgias form a link between the ordinary forms of neuralgia and migraine, and this should make us careful not to assume a pathology for either of these diseases which might not be applied, under proper restrictions, to the other.

It is clearly important that the periodic tendency of these neuralgias as compared with the neuralgias of the second and third branches of the fifth pair should be recognized from the point of view of treatment. I do not, of course, mean to say that these neuralgias are invariably of the form just described. Sometimes they certainly seem to be identical in character with the epileptoid neuralgias of the other two divisions, or distinct periodicity may be wanting. When, however, they are periodical they are remarkably susceptible to treatment by large doses of quinine, which should be given in such a way as to anticipate the attacks, and never during the attacks. The quantity may be run up rapidly to as large a dose as the patient is able to bear, being guarded, if necessary, by the bromides in full doses. Ordinarily, a dose of fifteen to twenty-five grains taken the night before the expected attack, or, still better, four hours before, will avert it. Generally, local treatment of the nasal catarrh of the frontal sinus is also desirable in these cases.

I do not, of course, mean to deny that periodicity of recurrence is seen with other neuralgias, for it is well known that it is sometimes well marked, but I know of none of which it is so characteristic as it is of the supra-orbital neuralgias.

In connection with this subject of the different morbid tendencies of the ophthalmic division of the fifth nerve as compared with the two lower divisions, it may be worth noting that herpes zoster is far more common in the area of distribution of that branch than over the rest of the face. It does, however, occasionally occur in the areas supplied by the lower two branches, either with or without the ophthalmic area.

THE NATURE AND TREATMENT OF INFANTILE PARALYSIS.

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INFANTILE paralysis, by reason of its mysterious onset, its frequency, and its sequelæ, is a most formidable disease. It appears to attack children of all stations and of both sexes. Though not confined to the period of infancy, by far the largest proportion of its incidence is found in the first and second years of life, after which it progressively decreases as age advances, and especially so after the third or fourth year. The fact of its attacking young children by preference has secured for the disease the name by which it is, even now, best known,—infantile paralysis. Even when attacking men and women it is not infrequently spoken of as “infantile paralysis in adults.”

I propose to discuss the disease, very briefly, under the following headings: morbid anatomy, causation, mode of onset, diagnosis, prognosis, and treatment.

MORBID ANATOMY.

It will be allowed that “infantile paralysis” as seen in a children’s hospital is a symptom—often a very complex one—rather than a disease. Though a very essential feature during life, the paralysis is not appreciable after death. The paralysis is the result of an inflammatory destructive disease in the anterior horns of the gray matter of the spinal cord,—an anterior polio-myelitis,—an acute spinal paralysis. Only within the past twenty or twenty-five years has the exact nature of the disease been known. Several circumstances explain this,—chiefly the want of material post mortem. The disease is not a very fatal one. If fatal cases occur during the early stages, they escape notice. If the cases live on for a while, secondary changes set in, which mask the primary, the essential lesion, and render it almost impossible for the pathologist

in any given case to state which are primary and which are secondary features of the disease.

A few well-marked cases in the early stage have, however, been examined, so that it is now fairly well established that *the essential lesion* consists in inflammatory softening of, with hemorrhage into, the anterior horn of gray matter, and as a result destruction of some of the large motor cells which are congregated there. In proportion as this lesion is acute and destructive will be the amount and degree of the resulting paralysis, while the exact situation of the lesion in the cord will determine what limbs or parts of limbs will be affected. In some cases the lesion is small and confined to the anterior horn; sometimes it is found to affect the antero-lateral column and even the posterior horn of gray matter. Indeed, sometimes nearly half the cord has been found diseased or destroyed. In such cases,—of extensive local lesion,—the clinical results are infantile paralysis, *plus* something else,—*e.g.*, rigidity, rapid wasting, trophic changes to be presently referred to. At an autopsy which I made some years ago on the body of a child who died six weeks after the onset of a severe and extensive form of the disease, the gray matter in all the length of the cord was soft and reddened, and in the lumbar enlargement on one side there was an extravasation of recent blood as large as a swan-shot. In some of the microsections this extravasated, unorganized blood crumbled away, leaving a hole, while in the posterior horn adjoining considerable though less advanced changes had taken place. If this child had lived, her paralysis must have been extensive, complete, and lasting; for repair could only have been very partial, a little more or less organized connective tissue in lieu of the highly-organized and special nerve-tissue which had been destroyed.

Examined at a later stage, when repair has been effected, there will be found an increase in the connective-tissue elements of the cord; these will be encroaching on the nerve-elements, and will cause them to atrophy. This encroachment will necessarily vary with the extent of the primary lesion. Most frequently it extends into the antero-lateral columns of the cord, a circumstance which, in my opinion, explains the contractions and rigidity which are not seldom found associated with the paralysis.

The examination of paralyzed limbs after death, as well as of those which have been amputated during life, shows very varying conditions. In all there is wasting of the structures. In some the structures are merely small and ill developed, while in others there is extensive degeneration. I have seen limbs in which the muscles were reduced

almost to masses of fat; and others, again, where there was no fatty degeneration worth mentioning. Sometimes the subcutaneous fat is ample, in other cases entirely absent. The bones are not otherwise changed in their naked-eye appearances, except as to size; they are smaller in all respects than the corresponding bones of the sound limb. I have not myself found that there is any undue brittleness in these cases, as has been asserted by some observers. Nor have I observed, clinically, any facts which would lead me to suspect that these bones are more liable than others to fracture during life.

Examination of the nerve-trunks in an amputated limb revealed a fibroid degeneration with wasting of the axis-cylinders. They felt tougher and more resistant than normal; in size they were unaltered. The ligaments were usually very loose, as if they had lost tone. This was not improbably due to stretching, as they had in many cases to support the weight of the limb. I have not made any microscopic examination in such cases.

CAUSATION.

Sex appears to have little or no influence on the etiology of the disease. About as many boys as girls fall victims. Some authors state that more boys than girls suffer from this disease. "Catching cold" is sometimes asserted to be a cause. Getting wet through has also been reported as a cause. Social position seems to exercise no effect. Accidents, falls, blows, have been credited with cases. But I doubt whether such causes can be seriously invoked. A notion that injury has a good deal to do with the onset of this disease is widely prevalent among the lay public. In looking through my note-books I constantly find reference to accidents of one sort or another as the asserted causes. I know of a well-marked case which was stated to have followed on a fall down-stairs; but the illness did not commence for two weeks after the fall, and the child appeared quite well in the interval between the fall and the onset of the disease.

It is easy to understand that a severe concussion may give rise to hemorrhage into the cord or brain, especially in young children, whose nervous system is in a condition of great physiological activity and growth. The fact that most typical paralysis occurs among well-cared-for children without any appreciable cause, without the intervention of any traumatism, leads me to regard the traumatism in the so-called traumatic cases as a coincidence in most cases. If the paralysis occurred immediately after the fall, there might then be some connection; but even then it would be necessary to prove that the fall itself was not connected with the disease in the spinal cord.

I rather incline to accept as the cause some special vulnerability of the infantile nervous system. The relatively large size, vascularity, and rapid development of the nervous system are some of the best recognized characteristics of the organism during early life. Every other system is liable to inflammatory disease at this period for which no very definite cause can be assigned: why not, then, the nervous system? Fortunately, some of the other organs are less highly specialized, and the effects of disease are less obvious, less lasting, and may thus escape observation.

Is it merely a coincidence that infantile paralysis occurs at the age when rickets is most obviously developing? Can there possibly be some sort of connection? Rickety children are well known to have vulnerable nervous systems. As bearing on this point, I shall presently point out that a good anti-rachitic diet is most useful in treating these paralyzed children during the very early stages.

MODE OF ONSET.

The mode of onset varies very much. Some of the most typical cases of infantile paralysis which have ever come under my observation have come on quite suddenly,—without any warning. Children who appear to be in perfect, even robust, health are attacked quite as often as more weakly ones.

The following is a typical history. A baby, say ten months old, is put to bed in his usual health. Nothing unusual is noticed during the night, but in the morning on preparing to wash and dress him he is found to have lost the use of one arm or leg or of both legs. There is no fever nor pain. After three or four weeks he has regained some power, but either the leg or the arm or some muscle or group of muscles remains paralyzed. Sometimes such a history is amplified, as likely as not from the mother's troubled brain, by the recollection that a few days or weeks ago the child had a fall. I do not think I shall be far wrong in stating that in nearly one-half of the cases the disease comes on without recognizable symptoms, and that on inquiry some such history as the foregoing will be given by the child's mother or nurse.

In another set of cases there are some more or less acute symptoms: the younger the child the less definite are these symptoms. For, as a matter of fact, feverishness, loss of appetite, depression, general malaise, even convulsions, are the symptoms which usher in all disease in young children, and, though present in many cases, are not in any strict sense characteristic of infantile paralysis.

But in a few cases acute symptoms lasting days may usher in the paralysis. The following is an example. A girl, aged about three years, was taken into the hospital suffering with great pain in the head. Her temperature was high, her skin irregularly flushed, and she was very restless. During the late evening or early morning she cried out, as children do with meningitis. For two or three days this disease was suspected. But the symptoms gradually passed away, leaving the child in a somnolent condition, very weak and prostrate. As convalescence set in, she was found to be extensively paralyzed. It was now evident that she had been suffering from acute spinal paralysis.

Though I have had a great many cases of this disease under my care, I am free to confess that I have seldom seen or recognized the disease during the acute stage,—that is, previously to the onset of the paralysis. The paralysis, at first, is often generalized; that is to say, it may affect all four limbs as well as the trunk-muscles. But as the acute stage passes off, power is regained for the most part, paralysis of one limb, or of one group of muscles, or even of one muscle, it may be, alone remaining to tell the tale. Indeed, in the great majority of cases I should think that finally the paralysis affects parts of limbs rather than a limb in its entirety.

After an extensive paralysis during the acute stage, it happens occasionally that the parts permanently damaged belong to different sides of the body. Thus, a deltoid of one side and the leg-muscles of the other side—so-called crossed paralysis—will be found associated.

More or less complete paralysis of both lower extremities (lumbar paraplegia) is by no means uncommon. On the other hand, paralysis of both upper extremities (cervical paraplegia) belongs to the rarest of clinical phenomena. Some muscles show a special proclivity to be affected (or rather the nerve-centres controlling them): thus, the deltoid in the upper extremity and the peronei muscles in the lower extremity are very frequently affected. *Per contra*, the finger-muscles and the psoas and iliacus muscles escape, even when the paralysis is severe and wide-spread. The muscles of the trunk, especially of the back, suffer more frequently, I think, than is generally supposed. I incline to the belief that many cases of angular curvature of the spine are due to the action of unantagonized muscles brought about by this cause.

Cases are met with in which the onset is very definitely associated by the parents with injury. Thus, a girl was recently brought to me suffering from paralysis of the right leg: there was considerable wasting of the muscles of the leg, as well as those of the thigh, from disuse, with shortening and a certain amount of weakness. The history was that

when a baby she had been upset out of the perambulator, and that her hip-joint had been "dislocated," since which the shortening and wasting had supervened. The nurse, fearing the consequences of her carelessness, had said nothing about the accident for some weeks : hence no treatment had been adopted, and in consequence the leg had become paralyzed.

An unusual case occurred among my hospital patients some years ago. A child, two years and three months old, was admitted on account of a glandular abscess in the neck, connected with *pediculi capitis*. It was opened and discharged itself and in the course of two or three weeks was quite healed. The child was ill fed and weakly, so she remained in the hospital. A month later quite suddenly the child's head began to droop so that she could not hold it up ; the chin rested on the sternum ; there was no pain, sensation remained normal, there was pyrexia, the temperature reaching, on two occasions, 102° F. This condition and the paralysis remained for about three weeks, then began to pass away. At first the head could not be moved at all. The rotatory movements returned, and finally extension movements. The child remained in the wards upward of five months ; when discharged she was given a leather collar so made as to support and fix the head in the upright position. Six months after her discharge, it was noted that the movements of the head were all but completely restored : the child was improved also in general physique.

DIAGNOSIS.

Rilliet and Barthez's dictum, "*La paralysie est toute la maladie*," sums up the diagnosis very practically. Though nearly true, it is not quite so. For there is a condition antecedent to the paralysis, as well as a subsequent stage, at which paralysis does not obviously exist. Reference has already been made to the absence of any characteristic symptoms during the initial stage in a great number of the cases. A guess can sometimes be made, but a diagnosis rarely.

In a great many instances the diagnosis is clear enough without asking a single question. A healthy-looking child is brought whose only defect perhaps is inability to raise the arm from the trunk ; the forearm and hand can be moved freely. There are no marks of injury ; passive movements can be made in any direction without causing pain and without difficulty. The intelligence is perfect. Such symptoms are incompatible with fracture or dislocation or local disease. Hence no other diagnosis is possible than infantile paralysis affecting the deltoid muscle.

Cases sometimes present themselves in which there is no paralysis, even, but which nevertheless belong to the disease. For instance: A young lady is brought to you because she has commenced to limp. There has been no injury and no pain, and there is nothing wrong as far as the mother can see. But on careful examination with the eye, the hand, and a measure, one limb will be found smaller than its fellow. On inquiry it may be ascertained that the patient is growing rapidly, perhaps has recently commenced to grow. A limb which has once been paralyzed, even though it may seem to recover, will subsequently be less strong, less vigorous, less enduring, and will grow rather slower, than its unaffected fellow. The difference may be very slight and for a while escape notice. It is chiefly in those who grow very tall and very rapidly that the asymmetry becomes noticeable.

A differential diagnosis between infantile paralysis and some other paralyzes affecting children will occasionally have to be made. With the exception, perhaps, of diphtheritic paralysis, there will be little or no difficulty, and only in a few instances is diphtheritic paralysis liable to be in question. Infantile paralysis has never, so far as I know, affected the eye-muscles; but of all muscles after diphtheria those of the eye are the most liable to suffer, and, after these, the muscles of the palate and pharynx. The muscles, one or more, of the leg, singly or in groups, are affected after diphtheria; and these cases are very similar to the results of anterior polio-myelitis, not only clinically (for a limited time), but also pathologically. In diphtheritic paralysis the onset is rather slower, the duration shorter, the recovery quite constant and complete; the muscles do not waste, and there is no diminution in their faradic excitability. In many of the cases the history of diphtheria is very slight.

In ninety-nine cases out of a hundred, loss of power in one limb or in more than one limb or in a group of muscles of a limb, coming on rather suddenly, without very marked symptoms or cause, during childhood, may be diagnosed as "infantile paralysis." If any long interval since the onset have occurred, there will be more or less atrophy of the affected parts, chiefly in but not confined to the affected muscles; and in a certain proportion of the cases there will be contraction of some of the now paralyzed muscles.

PROGNOSIS.

1. *Immediate.*—The prognosis as to life, in the acute cases and stages (should any cases be met with), may be guardedly favorable. In my own experience, extending over some years both in the wards and

in the post-mortem room, deaths from this cause are very uncommon in children.

It is equally rare for a considerable amount of the early paralysis not to clear up: this may occur sometimes with considerable rapidity; in some cases weeks may elapse. But some improvement nearly always occurs, sooner or later.

Any paralysis which persists for three months will probably remain permanent. The muscles of the trunk, head, and neck more frequently recover than those of the limbs, and recover more completely.

2. *Remote*.—The prognosis as to the usefulness of the limb should always be guarded and unfavorable. I have never known a case of infantile paralysis get well after lasting three months. Once paralyzed, always paralyzed. The greater the initial damage to the cord, the deeper will be the damage to the limb; every tissue in a limb subsequently suffers. The bones as well as the soft parts will be dwarfed and weaker than those on the opposite, unaffected side.

The cases referred to in the last section, of very slight shortening with equally slight differences in the growth, size, and strength of a limb, often only noticeable about fourteen to sixteen years of age, doubtless represent a minimum of damage to the cord. Even this minimum can never be made good, and so the limb will always remain a little behind its fellow both in its measurement and in its capacity for sustained work.

The age of the patient at the time of the initial attack is an element of importance in answer to such a question as the following: Is the limb likely to be much shorter than its fellow? That will depend upon how much the patient has to grow: is he quite a child, and has he all his growth to make? It will be obvious that the more he has to grow the greater is the probability of a shortened limb. A limb never gets smaller, though it may cease to grow, or may grow very much more slowly than its unparalyzed fellow. The difference in length depends on the more rapid growth of the sound limb: the more this grows the more marked will be the difference in length between the two.

The surgeon is often asked whether deformity is likely to come on. For my own part, I hold that deformity is no necessary sequel to paralysis. A paralyzed muscle remains helpless and flaccid: it atrophies partly from its disease and partly from its enforced inaction. Its antagonizing muscles also atrophy; for a muscle, though it can contract and shorten itself, cannot elongate itself; hence having once contracted it remains so and becomes inactive as if it were paralyzed.

When there is spastic rigidity of some muscles and paralysis of others, we have to do with a lesion which has spread beyond the limits of the anterior gray horns of the cord ; in other words, we are then dealing with something more than infantile paralysis. This rigidity usually comes on quickly and differs from simple contraction ; for the latter can be overcome by passive movements. It is a local condition, while rigidity is a central one. It is quite easy to understand that a third, perhaps even a quarter, of the total cases are complicated with more or less deformity. It is quite easy also to understand that an inflammatory lesion, such as this, cannot be strictly confined to the central gray matter if it is at all extensive. It may be very nearly so in some cases ; these are doubtless the cases which clinically are very slight and very local. As repair and cicatrization take place, some secondary involvement of neighboring parts is almost sure to set in. Deformity (club-foot, and the like) comes on very gradually ; it is as often as not brought about by the efforts of the patient to walk on an ill-balanced foot. Such cases and consequences ought, I think, to be carefully differentiated from others which may depend on spastic rigidity.

Does infantile paralysis affect the brain,—that is to say, the intelligence? This question is not infrequently put to the doctor by anxious parents. In my own experience, I should say, never. The lesion is purely a local one, and after three or four months probably remains quite stationary. There is no fear of its spreading up or down the cord.

TREATMENT.

Treatment may very conveniently be considered :

1. During the acute stage. 2. Very shortly after the acute stage is passed. 3. During the later stages.

1 and 2. Cases of infantile paralysis during the acute stage rarely come under the surgeon's notice ; even when they do, they are seldom recognized until paralysis—which is the sequel rather than the disease proper—has set in. It is difficult, therefore, to lay down any precise rules for treatment.

But if the cases come very shortly after the paralysis has manifested itself, then, in view of the known condition of the spinal cord,—a more or less acute and extensive myelitis,—useful treatment may be recommended and undertaken.

First and foremost comes rest in bed until the inflammatory stage is well over, not only to prevent further inflammation and hemorrhage, but also to give the already diseased parts an opportunity to recover. Locally, over the spine, on each side of the middle line, counter-irri-

tants may be applied. Nothing is better for this purpose than "flying blisters,"—that is to say, the application of blistering fluid over small areas, frequently repeated. In this way large open sores are avoided, while an effective counter-irritation can be kept up as long as is desired. Strong tincture of iodine may also be used for the same purpose.

Dry-cupping is another excellent plan of treatment, small cups being used at short intervals along each side of the spine. Whichever plan be preferred, it should be most persistently used in that part of the spine which seems to have suffered most.

Friction and shampooing are also indicated, along both the spine and the limbs. The patient should remain passive and recumbent. I think it well as far as possible at this stage to suppress all voluntary effort to move the muscles, as this necessarily determines blood to the affected centres, and may make matters worse rather than improve them.

For internal treatment during this stage, I have found belladonna combined with potassium iodide most useful. I order, according to the age, a quarter of a grain of the extract with two or three grains of the iodide in sweetened water three or four times a day. The loss of power is often the only subjective symptom: should other conditions be present, they must be treated on general principles.

3. During the later stages.—When the more chronic stages have been reached, local treatment for the paralyzed limb is chiefly wanted. The degree and extent of the paralysis vary from paresis of a single muscle to absolute loss of power in a whole limb. Sometimes a walking-stick suffices for the patient, while in other cases elaborate instruments are called for to enable him to support himself when walking or trying to walk. The indication is to supply, artificially and in every possible way, the lost power. Assist that muscle or group of muscles which is weakened. Maintain the limb or foot in as natural a position as possible, as this will materially help a weakened muscle to act.

The healthy muscles act in concert, with and against one another. When anything interferes with this concerted action, all the muscles—the healthy ones as well as those which are paralyzed—are placed at a disadvantage. Hence it is that limbs of which only some muscles are affected gradually waste and lose power.

I have already stated my belief that deformity is no necessary sequel to infantile paralysis: when present, it very often assumes the nature of a club-foot. But it can very easily be prevented, if care be exercised. As regards its treatment, space will not permit me to enter upon this subject at any great length. In many cases the deformity can be rectified without surgical operation. The more marked the

paralysis and atrophy, the less willing I am to advise operative treatment; for the vitality of such a limb is lowered. Beyond a tenotomy, therefore, I think it unwise to go, and not even to perform this operation until mechanical means have failed.

As regards instruments, I will only say that they should be as simple and as light as possible. Many a time I have seen paralyzed children who have suffered more from instruments than from paralysis, and who have commenced to improve and get strong as soon as their cumbersome heavy instruments were discarded. Their boots, too, should be light and fit accurately; because when they are either too loose or too large, they cause sores, in the one case from friction, in the other from pressure.

A great deal of support, as well as warmth, can be obtained from a well-applied flannel bandage. If the ankle be very weak and the ligaments lax and loose, a flannel bandage from the toes upward with two or three or four figure-of-eight turns around the ankle-joint will give more support often than can be obtained from a mechanical appliance, besides having the advantage of being cheap and always available. I merely mention this as an example of what can often be done without the expensive instruments which by some are considered absolutely necessary.

Special manifestations must be met. When there is much atrophy and when the circulation is bad, means must be adopted to protect the limb from cold and changes of temperature by the use of warm woollen coverings. Stimulating liniments may be applied from time to time and well rubbed in. By such means chilblains and ulcerations can alone be prevented or cured. Over and above these local measures, general treatment must be insisted upon, and everything done to keep up the general nutrition and to promote metabolism. Tonics, including iron, arsenic, strychnine, cod-liver oil, will be found useful. Fatigue, in every shape, must be avoided. Prevent, if possible, paralyzed children, even those with the slighter forms, from attempting too much. When at school a desire to excel—to keep up with the others—may lead to more exertion than is good for a child handicapped with a paralyzed limb: this fatigue cannot fail in the long run to injure the child.

Electricity has no special action on these paralyzed limbs. It is chiefly useful in improving the tone of muscles which are weak from disuse and want of antagonism. Careful rubbing has just the same effect. This is hardly the place to discuss such debatable practice as the excision of joints for the purpose of securing ankylosis and a rigid

limb, nor amputation of useless members. Both practices, though good enough in their way, are called for only under special circumstances.

General treatment, especially in the old chronic cases, sometimes brings about improvement in the affected limb less than in the body generally, and in the muscles of a limb which are atrophied not because of paralysis but from want of use. A week or two specially devoted to this purpose, when the patient's means will allow of it, can be wisely recommended once every year. It will be found especially useful for children who live in hot and relaxing countries. But in recommending it, let the object be plainly stated. Above all things, home treatment and careful supervision must be continuous. Treatment at best is but palliative; for the causative lesion is quite beyond the surgeon's reach.

In the early stages, shortly after the initial lesion, diet is of importance. The majority of cases, as has been said, occur in young children. For such, a thoroughly anti-rachitic diet will be found eminently serviceable.

RISES OF TEMPERATURE DUE TO DISEASES OF THE CEREBRUM.

CLINICAL LECTURE DELIVERED AT GUY'S HOSPITAL.

BY W. HALE WHITE, M.D., F.R.C.P.,

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GENTLEMEN,—About five years ago I gave a clinical lecture on some cases in which a rise of temperature above the normal was due to disease of the cerebrum. To-day I propose to put before you an account of cases that have come before me since that lecture.

First let me remind you which are the parts of the nervous system that from our knowledge of physiology we should expect to have the power of modifying the temperature of the body. The diagram on the wall, which I have often used for teaching purposes, and which you will find in my book on *Materia Medica*, will help us in this matter. We see it shows that the chief heat-producing organs in the body are the muscles, and that these, which are consequently called the thermogenetic tissues, are, as regards this function of thermogenesis, under the control of the corpus striatum. It shows that the loss of heat takes place mostly from the skin by evaporation of the sweat, by radiation, and by conduction, and from the respiratory mucous membrane by evaporation of moisture and by conduction; therefore the chief thermolytic organs of the body are these parts. This thermolytic function is under the control of the central nervous system, principally the vasomotor and sudorific centres in the medulla and cord. Now, you will notice that these "centres" for thermolysis, and also the corpus striatum, the "centre" for thermogenesis, are connected with a third "centre," the thermotaxic centre, the function of which is so to control the heat-producing or thermogenetic centre and the heat-loss or thermolytic centres that the temperature of the body shall be always constant. This thermotaxic centre is most likely situated somewhere on the cortex of the brain. All three centres are probably capable of being

affected by afferent impulses and by the quality of the blood circulating through them.

I propose to-day first of all to show you that experiments upon animals prove that the corpus striatum and the cerebral cortex have some influence on the temperature of the body, but that there is a difference in the influence which they exert; and next I shall bring forward certain cases in which the corpus striatum was damaged or there was obvious disease or perhaps only disordered function of the cortex, and in which the temperature was modified in the same way as it was by experiments on animals. We shall not allude to instances from clinical medicine of thermolysis.

In the tables which I have fastened up by the side of the diagram you will see the results of a number of experiments I have performed upon rabbits.¹ The first thing shown was that the normal rectal temperature of a rabbit was between 101° and 103° F. Then it was demonstrated that neither the administration of an anæsthetic, nor trephining the skull, nor cutting the dura mater, nor passing a probe in the white matter of the brain had any effect on the temperature. Twenty-three experiments were then made in which the corpus striatum was damaged; in four the temperature rose above 106° F., and in three others it rose to 106° F., so in about a third of them a great rise was produced. In the remaining two-thirds a considerable rise followed the experiment. But in all it was probable that the optic thalamus was damaged as well as the corpus striatum. Therefore, in a second series the attempt was made to limit the lesion to the optic thalamus; this was successful in twelve instances, but in four others the corpus striatum was damaged. Now, in the twelve in which the optic thalamus alone was implicated the temperature never rose more than a fraction of a degree over 103° F., but of the four in which the corpus striatum was involved, in two it rose over 105° F., and in the other two over 104°. I think, therefore, I have proved that damage to the corpus striatum does cause a considerable rise of temperature. A chart on the wall shows the rise produced in a typical experiment.

The next part of the brain investigated was the cerebral cortex. The posterior region was operated on in twenty-four experiments; in each, part of the cortex was destroyed. These experiments showed that generally there was an increase of the rectal temperature after the cortex was destroyed, but this was not always the case, and sometimes

¹ *Journal of Physiology*, vols. xi. and xii.

the rise was slight and irregular. One of the charts shows the result of an experiment.

I have therefore shown that we ought to find clinically (1) that damage to the corpus striatum will cause a rise of temperature; (2) that damage to the cerebral cortex will do the same. I cannot here go into the reasons, but it is highly probable that the corpus striatum is concerned with heat-production and the cortex with thermotaxis. If this is so, the rises after damage to the cortex ought to be much more irregular and uncertain than those which follow upon lesions of the corpus striatum.

Of course, as these two parts have an influence on the temperature of the body, if the fibres proceeding from them are damaged we should expect some alteration in the temperature, and experience teaches us that such is the case; for instance, hemorrhage into, or a tumor of, the pons Varolii frequently leads to a great rise of temperature, and you all know that injuries to the spinal cord, especially its upper part, have the same effect. One of you recently kindly gave me the temperature-chart of a man who was in one of the surgical wards for injury to the spine. His temperature reached 107° F. But to-day we will confine our attention entirely to pyrexia due to visible disease or disordered function of (1) the corpus striatum, (2) the cerebral cortex.

I. *Pyrexia due to disease of the corpus striatum.*

In a paper which I published in the "Guy's Hospital Reports" (vol. xlii.), "On the Theory of a Heat-Centre from a Clinical Point of View," will be found several cases in which disease of the corpus striatum caused a rise of temperature. Case VIII. there recorded is that of a boy who was admitted for right hemiplegia. For the first month his temperature was normal, but then it rose to 102.4°; from this time till his death, two months afterwards, it frequently rose very high, often to 106° or 107° F. At death, softening of both corpora striata was found, and there was nothing else to account for the rise of temperature. Case II. is an important one. A man was admitted with left hemiplegia; the temperature in the left axilla was 95.6° F. Seventeen hours afterwards in the right axilla it was 105.4°; left axilla, 106.8°. An hour and a half later it was 107.2° in both axillæ. An extensive hemorrhage was found in the right corpus striatum.

Between the publication of this paper and the last clinical lecture on the subject two cases occurred under my care in the hospital; they are both published in the *Lancet* for June 29, 1889. The first was that of a man who had paraplegia. During the last five days of his life his temperature was raised, the highest point reached being 103.6° F.

At death there was found softening of both corpora striata due to atheromatous vessels. The second was that of a man who was admitted for left hemiplegia, left hemianæsthesia, left homonymous hemianopia, and left-sided deafness. On admission, the temperature in the left axilla was 98° F., in the right 97.6° . After this the temperature rose so that on the fourth day it was 100.2° in the left axilla. The temperature in the left axilla was always higher than in the right, sometimes as much as two degrees, till the ninth day after admission, after which the temperatures were similar. Among other lesions there was found softening of the right corpus striatum secondary to embolism.

We now come to the cases which have come under my care since the last lecture on this subject; there are three of them.

CASE I.—A man was admitted in October, 1889, for ordinary right hemiplegia. The chart which I show you shows the temperature taken in both axillæ. You will notice that it was raised considerably, but that it was nearly always higher on the paralyzed side than on the sound one. After death it was found that there was a large hemorrhage on the left side of the brain, destroying the island of Reil, the lenticular nucleus, part of the optic thalamus, the external capsule, and the posterior half of the posterior limb of the internal capsule. The caudate nucleus was considerably bulged out into the lateral ventricle. He died twenty-four hours after the last temperature observation shown in the chart; during this time the temperature was the same in the two axillæ and was about normal.

CASE II.—An elderly woman was admitted November, 1890. She had right hemiplegia with aphasia. The attack of hemiplegia was sudden and had come on several days before admission. When she came in, the temperature was about normal and almost the same in the two axillæ. After she had been in four days, however, it suddenly rose to 101.6° F. in the right axilla and 100° F. in the left. During the next three days it slowly sank to normal, and for four more days during which she stayed under observation it remained either normal or subnormal; but that in the right axilla was always higher than that in the left till the last two days on which observations were taken, when the temperature was the same in both axillæ. The greatest difference between them was 2.6° F. There is very little doubt that this woman had cerebral hemorrhage, and that the rise of temperature on the fourth day of her admission was due to some fresh bleeding into the corpus striatum.

CASE III. is that of a girl who was admitted under my care on

February 12, 1891, with right hemiplegia due to cerebral embolism. Presystolic and systolic murmurs were audible at the apex; the spleen was enlarged. You see that the chart shows the temperature in the two axillæ, and you will notice that for the first five days it was raised, then it became normal, and after that subnormal, but it always remained highest on the paralyzed side. There was considerable doubt, when the temperature was first taken, whether or not its rise was due to malignant endocarditis; therefore I had it taken in the two axillæ, and the discovery that it was higher on the side opposite the lesion showed that even if part of the rise was due to malignant endocarditis, part must be owing to the cerebral lesion, for a general cause such as malignant endocarditis would raise the temperature equally in the two axillæ. In fact, it was quite possible that the patient's temperature was entirely due to the cerebral embolism. This case illustrates the importance of taking the temperature in both axillæ: if this had not been done the patient would have been regarded as having malignant endocarditis, but we were enabled to show that this could not be the entire explanation of the pyrexia. She got sufficiently well to go out, but she came back again in a few months with increasing dyspnoea, and ultimately she died. A patch of old softening was found in the left corpus striatum, explaining the pyrexia and its character.

I have now related five cases that have been under my own care and two from my paper in the "Guy's Hospital Reports," or seven in all, in which damage to the corpus striatum in man caused a considerable rise of temperature, and therefore we have the great pleasure of seeing that clinical medicine confirms our physiological experiments.

I want also to direct your attention to the following points, all of which are illustrated by one or more of these seven cases.

1. If only one corpus striatum is damaged, the temperature will be higher on the opposite side of the body,—that is to say, if the patient have hemiplegia, the temperature will be higher in the axilla of the paralyzed side,—although it is raised in both axillæ. The probable explanation is this. The heat-fibres from the corpus striatum, like the motor fibres from the cortex, decussate. Thus, owing to the damage to the corpus striatum, more heat is produced in the muscles on the opposite side of the body than in those on the same side. The blood circulating through these muscles in which this increased thermogenesis is going on is warmed, and therefore, of course, the temperature of the whole body is raised, but the rise is naturally greatest nearest to the source of the increased heat.

2. If the case is one of cerebral hemorrhage, for the first few hours

there may be a considerable fall of temperature owing to the severity of the shock (see one of the two cases taken from the "Guy's Hospital Reports"), but as the effects of this pass off, the rise of temperature due to damage of the corpus striatum shows itself.

3. In the case of sudden damage to the corpus striatum the rise of temperature takes place quickly, usually attaining its maximum within twenty-four hours. It then slowly falls, the normal point being reached in a few days.

4. After it has reached the normal it usually falls about a degree below normal, and remains subnormal for a few days before again attaining the healthy standard. When it is subnormal the temperature on the side opposite a unilateral lesion is usually a little higher than that on the same side.

II. *Pyrexia due to disease or disordered function of the cerebral cortex.*

In the paper in the "Guy's Hospital Reports" I recorded the case of a man under the care of Mr. Davies Colley who shot himself in the head. The bullet was extracted at once; it was found at the apex of the orbit. Directly after the operation the temperature was 99.2° , but in the course of four hours it ran up to 104.2° , and remained high. Half an hour before death, which occurred twelve hours after the operation, it was 104.4° . The lesser wing of the sphenoid was broken into several pieces; the parietal and the third frontal convolutions of the right hemisphere were severely contused. The rest of the body was perfectly normal.

Cases of meningeal hemorrhage are less useful than you would expect for determining whether damage to the cortex can produce a rise of temperature, for they are uncommon, the shock is often severe, they are often quickly fatal, and if the blood is at the base pyrexia may be due to pressure on the pons.

In Dr. Goodhart's paper on "Meningeal Hemorrhage," in the "Guy's Hospital Reports" (vol. xxi., series 3), Case XXXIII. had soon after admission a temperature of 103.2° , which rose before death to 105.7° . It was found that the whole surface of the cerebrum was covered with effused blood. In Mr. Jacobson's paper ("Guy's Hospital Reports," vol. xliii.) the temperature is worth noticing in the following cases:

CASE XXVII.—The patient fell on his head at 1 P.M. At 4 P.M. he was trephined and a quantity of blood-clot was taken away. 7 P.M., temperature 100.6° ; 1 A.M., 106° ; 2.30 A.M., 106.4° ; 3 A.M., death; 3.30 A.M., temperature 108.4° . At the post-mortem examination the

remains of a blood-clot were found; the skull was fractured. The brain seemed perfectly healthy.

CASE XXVIII.—Two hours after the patient fell she was trephined and a quantity of clot was removed. A few hours after the temperature was 103° F.; three hours later it was 103.6°; and three hours later still, when she died, it was 103°. At the post-mortem examination there was found a fracture of the middle fossa of the skull. On the side opposite the hemorrhage were three small superficial lacerations of the temporo-sphenoidal lobe.

CASE LIII.—The patient, at death, had a temperature of 102°. He was trephined two days before for middle meningeal hemorrhage. He had a fractured temporal bone and laceration and ecchymosis of the brain.

CASE LIV. was very similar, and in this also the temperature reached 102° F.

CASE LVI.—In this case there was fracture of the skull, with middle meningeal hemorrhage, and the under and outer part of each cerebral hemisphere was lacerated. About half an hour after the accident his temperature was 95°. He survived twenty-four hours. Two hours before death his temperature was 104.8° F.

CASE LXXI.—In this there was extensive fracture of the skull, a large blood extravasation between the skull and the dura mater in the right temporal region, together with some damage to the subjacent brain. At first the temperature was below 96°, but fourteen hours after it was 106°, and sixteen hours after it was 107°.

CASE LXXVI.—In this case blood was effused over the cerebral cortex. The temperature rose to 103°. Mr. Jacobson, at the end of his paper, refers to one by Dr. Wiesman, who gave a rise of temperature as a symptom of middle meningeal hemorrhage. The highest he mentions was 109° F.

Mr. Golding-Bird records in the "Guy's Hospital Reports" (vol. xlv.) two cases in which there was meningeal hemorrhage, and in one of them, a few hours after the accident, the temperature was 102.8°. We have here, therefore, nine cases in which the cerebral cortex was either contused and lacerated or pressed upon by blood-clot, and in all of them the temperature was raised, often very considerably. In none was there any other cause for the rise of temperature, and in all it followed so quickly upon the damage that it cannot have been due to any secondary inflammatory trouble.

As you are probably aware, whilst in most inflammatory diseases the temperature runs a more or less defined course, in meningitis it is

very irregular. Thus, Dr. Fagge tells you the temperature may towards the end of a case of meningitis run up very high, or it may sink very low, and the difference between the example of each variety that he gives is nearly 30° F.; and Gowers tells us that it may be very high, or it may be very low, or it may be normal. I have often had opportunities at the bedside of pointing out these peculiarities of the temperature in meningitis, and I will to-day bring before your notice two cases illustrating it.

The first was a man who was under my care. He had syphilitic disease of the nasal bones, and this led to purulent meningitis. I show you his temperature-chart, and you cannot fail to be struck with the wide range and the great irregularity of the temperature, which in a few hours varied between 106° and 96°.

The second case is also one of suppurative meningitis. He was a butler, addicted to alcohol. He came in under my care on the afternoon of March 27, 1887. In the evening he was so noisily delirious that he was removed to the strong room. His hands and tongue were trembling, temperature 100°. 28th, 10 A.M., head strongly retracted, occasional universal convulsions, was unobservant, constantly muttering, but replied when spoken to. Had to be fastened in bed. 1 P.M., temperature 105°; 3 P.M., 106.4°; 4.05 P.M., 107.2°; sponging with cold water and packing with blocks of ice begun at 4 P.M. and continued till 4.15 P.M. Five grains of kinate of quinine subcutaneously. 4.15 P.M., temperature 108°; 4.35 P.M., temperature 106.8°. Bath at 50° F. given till 4.45 P.M. 4.45 P.M., temperature 105.4°; 4.50 P.M., 103.6°; 5.10 P.M., 101°; 5.30 P.M., 97.8°. Rather collapsed; was given brandy, and hot-water bottles were applied to his feet. 6.15 P.M., temperature 97.8°; 7.10 P.M., 99.8°; 7.40 P.M., 101.2°; 8 P.M., 101.4°; death. 8.10 P.M., 101.6°; 8.50 P.M., 100.8°. At the post-mortem, except that he had suppurative meningitis for which no cause could be found, the body was perfectly healthy. The pus extended over the base, the cortex, and the cord.

Now let us see how our clinical facts harmonize with experimental evidence. Early in the lecture I showed you that in animals irregular alterations of temperature followed damage to certain parts of the cerebral cortex. This statement is, I think you will agree with me, amply borne out by clinical medicine, for I have shown you that laceration of the cortex of the cerebrum or the pressure of blood-clot on it may produce great rises of bodily temperature, and also that in meningitis the temperature is particularly erratic, a fact which is explicable if we suppose not only that the rise of temperature in this disease

is due to the suppuration, but also that the sudden variations of it are caused by the fact that the meningeal inflammation disorders the thermotaxic nerve-cells, which normally maintain an accurate balance between the production and the loss of heat, just the same as it disorders the psychical functions and causes delirium. In favor of this view is the fact that in meningitis the rise of temperature bears no relation to the rapidity of the pulse or the frequency of the respirations, which suggests that the amount of heat produced by the body is not by any means correctly expressed by the rise of temperature, or, in other words, that the alteration of the temperature is due not to thermolytic or to thermogenetic, but to thermotaxic influences.

We will now pass on to two functional diseases which will, I think, illustrate our subject. In epilepsy it is believed on very good evidence that during the fit there is functional disturbance of certain parts of the cerebral cortex. You would therefore expect the temperature to be raised after the fit, and sometimes you will find it is up a degree or so; and in that condition of frequently-recurrent fits in which the patient as soon as he is out of one fit passes into another, the temperature is often raised very high: it may be 107° F., or even higher if the case is about to prove fatal. The following case recorded by Professor Féré shows the rise of temperature in epilepsy. The patient had a fit at 4 A.M., and a second at 5 A.M. Professor Féré saw him at 10 A.M., and found his temperature 99.5° F. By 7 P.M. he had had forty-two fits; his temperature was 101° . The next morning the temperature was 102.4° ; he had had thirteen fits in the night. The fits during the next few days were very numerous, and the following temperatures were recorded: on the next day, the 14th of July, the temperature was 101.6° F.; on the 15th, in the morning, 101.4° F.; on the 17th, in the evening, 101.2° F. After this it did not rise much.

Leaving now the subject of temperature in epilepsy, we pass on to that in hysteria; this, too, is a functional disease, in which the function of the cortex is often disordered. Therefore you would expect, and I hope to show you, that rises of temperature may occur in hysteria. Eight years ago, when I first mentioned such cases, they were received with much scepticism, but now many text-books contain an account of what in England is called hysterical pyrexia and in France hysterical fever. I have notes of several cases, and I will quote you one or two.

A girl, aged eighteen, was in the hospital under my care in 1885; she came in on August 10. 3 P.M., temperature 104° . She complained of pain in the abdomen. It was noticeable that the pain was sometimes on one side and sometimes on the other. 6 P.M., temper-

ature 104.6°. August 11, 9 A.M., temperature 104.6°. By cold sponging it was brought down to 102°, but in an hour it was 103.2°, and at 6 P.M. was 105°. August 12, 9 A.M., temperature 102°; 6 P.M., 103.6°. August 13, 9 A.M., temperature 99.2°; 6 P.M., 102°. After this the temperature gradually fell to normal. At no time were there any signs to point to any organic disease whatever. She was discharged on August 30. On September 9 she was again admitted for pain in the abdomen, but she never twice referred it to the same spot, and if she was engaged in conversation the abdomen could be thoroughly manipulated without her showing any sign of pain. The most careful examination could not detect disease in any organs of the body. Temperature 103°. September 10, 2.45 P.M., temperature 105°; 10 P.M., 99°. September 11, 6 A.M., temperature 98.6°; 6 P.M., 104°. September 12, 6 P.M., temperature 102°; 10 P.M., 98.8°. After this date the temperature was normal till the patient's discharge. Every possible diagnosis was discussed at the bedside, but we could, after the fullest consideration, only come to the diagnosis that her pyrexia was hysterical.

The second case is that of a girl who had been in the hospital before for hysteria, and who had this time been drunk for four months before admission. She came under my care on April 19. 2 P.M., temperature 102.6°; 10 P.M., 105°. April 20, 6 A.M., 98°; 2 P.M., 104.4°; 10 P.M., 97°. April 21, normal or subnormal all day. April 22, 2 A.M., 98.4°; 10 A.M., 104.6°; 6 P.M., 105.6°; 10 P.M., 100.6°. April 23, 2 A.M., 97.6°. There was nothing of any further note about the case. No sign whatever was detected that there was any organic disease or that the girl was suffering from any specific fever. The want of correspondence between the pulse and temperature and the respiration and temperature was very marked; the temperature was often unequal in the two axillæ, and its fluctuations were very irregular and sudden. Although I had mentioned these two cases to you, I am extremely anxious that you should remember that it is a bad thing to talk too much about hysterical pyrexia, for if we get into the habit of diagnosing it we shall frequently overlook the real cause of the rise of temperature. Let me warn you to beware of it, and never come to the conclusion that your patient has it until you have thought a great deal about all the other possibilities which may explain the pyrexia. It is always a good rule in any patient to think of hysteria last, but this is especially true if the patient is suffering from pyrexia. However, if you do come across a case you will find that the following are the characteristics of hysterical fever:

1. It always occurs in women.
2. They are often otherwise hysterical.
3. They are of an age at which hysteria is common.
4. The temperature is erratic and often attains a great height.
5. It may be different at different parts of the body.
6. The effect of antipyretics upon it is uncertain.
7. The ratio of the pulse or the respiration to the temperature is often perverted.
8. The other symptoms of fever, such as rigors, hot skin, and delirium, may be present, but are often absent.

We see, therefore, that epilepsy and hysteria, two diseases in which the cortical functions of the cerebrum are disordered, confirm our cases of damage to the cortex, and therefore go to show that this part of the brain presides over thermotaxis, for disordered function of it may lead to irregular variations of bodily temperature.

I think, gentlemen, we have now finished our task. I set out to show you (1) that experimental damage to the corpus striatum causes a rise of temperature, and that the same is true in clinical medicine; (2) that experimental damage to the cerebral cortex causes a rise of temperature, and that the same is true in clinical medicine. Besides this, we have learned several points about the temperature in both these conditions, and also in epilepsy and hysteria.

Pediatrics.

ENURESIS AND NIGHT-TERRORS.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON MEDICAL COLLEGE.

BY OLIVER P. REX, A.M., M.D.,

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GENTLEMEN,—This boy, A. B., aged ten years, presents himself asking for relief from a trouble which is a great annoyance not only to himself but also to his parents,—the inability to retain his water. Perhaps nothing is more frequently brought to our notice, and, unfortunately, it is usually regarded by the care-takers of children not as a disease, but as the result of carelessness, a want of cleanliness on the part of the child, and the little patient is often severely punished in the effort to cure him of the habit. There could not be a greater error. It is unreasonable to suppose that the average child would wantonly soil itself and its bed and endure the discomfort consequent thereon. Again, it is often asserted that the child is lazy, does not care to rise in the night to void the contents of the bladder, or through fear evacuates in the bed. Now, while there may occur instances of the latter, for we constantly find this affection associated with “night-terrors,” yet in the great majority of cases the difficulty is solely due to a want of power over the sphincter, or a condition of the pelvic viscera which causes the involuntary discharge. Among the latter is the presence of seat-worms, which produce a constant irritation in the rectum and around the anus; or it may be a loaded bowel; sometimes, though more rarely, it is present in disease of the kidney, or as the result of masturbation. While each of these is to be looked for and corrected, if possible, yet I desire to impress upon you most emphatically the great importance of assuring the parents that ill usage of a child so afflicted is never to be tolerated, and that it is productive of more harm than good. Children have been whipped with great cruelty, have been subjected to frightful punishment, have been deprived of

their evening meals, and in one case I was informed by the parent that she had compelled her boy to sleep upon the bare floor without any clothing to keep him warm, as punishment, and as a last resort he had been brought to the doctor.

While we should examine each case for the purpose of learning, if possible, the cause, yet we may assure the parents that with reasonable certainty a permanent cure can be obtained, and that usually in a short time. One cause for the continuance of this trouble lies in the idea that the child will grow out of it or the belief that it is incurable, and hence we sometimes meet with cases in grown-up persons. I was consulted by a woman in the case of her daughter, aged twenty-three years, who had suffered from enuresis since childhood, who, when asked why she came now, replied, "Because she is to be married." I may be charged with too great positiveness, but I always assure those who consult me for this disease that they may look for a speedy and permanent cure.

In this case we find a healthy boy,—no evidence of the presence of intestinal parasites, nor of renal disease,—and our treatment will be to put him on the use of atropine and *nux vomica*.

Atropine, gr. i;
Water, ℥i.—M.

Sig.—Ten drops morning, noon, and night. Add to each dose two drops of tincture of *nux vomica* and a dessertspoonful of water.

In writing this prescription it is better to add to the solution of atropine some coloring matter, as tincture of cochineal, lest otherwise, the solution being colorless, a fatal dose might be taken. Do not forget that occasionally we meet with instances where in very small doses atropine produces its toxic effects, and we must always tell the parent what may be looked for, as in some instances the extreme dilatation of the pupil, the rash, and the dryness of the throat may produce great alarm. These results rarely fail to present themselves, but you will often find that the incontinence is permanently checked long prior to the toxic effect of the medicine being shown. Let me relate a case. A boy, aged twelve, who had had no previous treatment, took the remedy but two days; on the third, though no special physiological effects appeared, he reported that he was cured, and, while I deemed it better to continue the treatment for a week in reduced doses, the trouble did not return. My usual rule is to continue until the toxic effects appear, then reduce the dose gradually, but maintain the physiological effect for at least a week, then discontinue the drug, with the injunction to report at

once on the slightest appearance of a return of the trouble. In a hospital and large private practice of many years I have met with very few cases that refused to yield to this treatment, and a majority remained cured, though occasionally cases relapsed and demanded a renewal of the medication.

Unfortunately, many of these children have lost their parents, or, as I have found exceedingly common, have no mother, or only an apology for one, who neglects her children, and thus they go on for years until the condition become so offensive that relief is sought, with little hope of a good result. It has been observed that in many the incontinence occurs when the child rolls on its back during sleep, and to prevent this the small of the back is irritated with a blister or some irritant, so that the child involuntarily turns when it rolls on its back. In one case a blister was applied to the penis, a barbarous piece of work, reflecting no credit upon its perpetrator. A pad fixed upon the back will often act equally well. Of course when indications are present general treatment should be instituted as demanded.

In the case quoted in detail, the boy reported at the clinic, shortly after commencing the atropine and nux vomica, as relieved, not having once soiled the bed after the use of the remedy. This is a fair sample of many cases on my records. In some it is necessary to renew the treatment again and again at intervals.

In one or two extremely obstinate cases I obtained excellent results from a combination of ergot and nux vomica. In all cases of children it is better to begin with minimum doses and increase as may be demanded until the beneficial effect is obtained. Thus, for a child aged six years I administered six drops of the following mixture thrice daily :

R Tinct. nucis vom., fʒii;
Ext. ergot. fld., fʒvi;
Elixir. simp., fʒiii.

This, by the end of two weeks, had produced a permanent cure. You see, six drops for six years gives you an easy method by which to remember the dose. Should this not evince signs of controlling the trouble after a week's trial, gradually increase the dose one drop daily, watching for the toxic effects of the nux vomica. Except in rare instances, you will find children very tolerant of even the most energetic remedies, and they will often bear a dose which is large in comparison with the age. Do not too readily abandon a case as incurable.

NIGHT-TERRORS.

Very closely allied to this affection is the trouble known as night-terrors, and here we have a case which has the two diseases combined. This boy is only five years of age, but his countenance is that of one much older. He does not present the natural happy look of a child. Upon inquiry, we are told that he has a habit of starting up at night with a loud cry, exclaiming that some one is in the room. When first seen he appears as though not fully awake, or as walking in his sleep. This occurs nearly every night. He also wets the bed. Now, gentlemen, this is more common than we might suppose. Many children are afflicted this way, but almost invariably it is regarded as foolish fear, and the child is punished. After repeated scenes like this, the child is supposed to have some ailment, and is brought to the notice of the physician. Usually these cases are anæmic; there is want of nerve-force, poor digestion, constipation, depraved appetite, and restless sleep. The child objects generally to sleep alone or in the dark,—sleeps with apparent soundness at first, then starts up screaming, and with all the evidences of great terror. Some will walk in their sleep and wake in fright. In short, this affection shows a marked disturbance of the nervous system, and if neglected may lead to some form of insanity. As before mentioned, there are few cases of night-terrors which do not also have enuresis. Undoubtedly in some cases the child wets the bed through fear, as we know in such a condition the sphincters often relax and the contents of the rectum as well as of the bladder are evacuated; but this is not always the case, and enuresis in such instances is due to the same causes as mentioned when considering that affection. You should always regard these cases as of special importance. I could detail many instances where the child was in such dread of the dark, or of sleeping alone, as to live under a cloud, as it were, especially at the approach of night. Again and again children have told me that they would be so happy if it never got dark. Unfortunately, the belief on the part of parents that this must be whipped or in other ways “punished out of them” (to use a common phrase with parents under such circumstances) results in many children growing up in constant fear of the dark, and becoming morose, even idiotic, truthfully victims of mistaken ideas on the part not only of the parents, but even of the doctor. These little unfortunates demand not only our warmest sympathy, but, in addition, our earnest efforts to relieve their misery and, if possible, to lift the cloud under which they grope.

In the treatment the first and most important indication is to pro-

duce in the minds of those who have charge of the patient a conviction that much of the success of the treatment will depend upon their earnest co-operation. This fully obtained, the rest is rendered a much lighter task. Insist that nothing shall be omitted which will secure to the child peace at night. Always have the room lighted, and that sufficiently to remove those dark corners, full of evil-looking shadows, in which, in its terrified state, the child imagines he can see untold horrors. A bright light is not needed, as that is liable to promote wakefulness. If possible, have an older person sleep with the child, or sufficiently near to secure that feeling of safety which is so helpful in this condition. Next build up the system with tonics containing iron, and here one of the best is syrup of the iodide of iron, five to ten drops in free solution three times daily. Strychnine or nux vomica always aids in such cases. Where great evidence of anæmia exists, I employ a combination now much used in this hospital: dilute phosphoric acid, tincture of chloride of iron, of each two drachms; syrup, three ounces. Dose, one teaspoonful in water thrice daily. You get here a combination of iron and phosphorus which is of great value, and is quite agreeable to the taste, making a lemonade, so to speak, which I employ freely in many diseases of children. The phosphorus is indicated by the condition of the nervous system. Should the sleep be fitful and the child restless, bromide of sodium will always prove useful, say five to seven grains in camphor-water or cinnamon-water an hour before bedtime, and repeated as needed in an hour or more. Where great trouble is present, and the bromide does not readily relieve, I always have recourse to chloral, which I have found to be of great benefit and well borne by children at all ages.

It is well to impress upon parents the danger to be apprehended in these cases of the child becoming idiotic, etc., since otherwise, as it is liable to be troublesome to care for, and the treatment often extends over some weeks or months, the child is neglected, and all beneficial results are lost.

In this case, after several weeks of untiring care, the child was brought to the clinic showing a marked difference in every way. Particularly was the improvement noted in the look of happiness on the face of the little patient taking the place of the sad, fearful countenance on its first visit. The mother had faithfully carried out the plan detailed to her, and she almost immediately noticed an improvement in the child. When it started up at night it was readily controlled, the incontinence soon ceased altogether, the sleep soon became less broken, the appetite returned, and in every way the symptoms were

changed for the better. Very many of these cases occur at children's asylums, boarding-schools, etc., where less interest is taken in the individual cases, and severity takes the place of intelligent, kind treatment; therefore these children are less likely to show good results than when under the care of a loving mother or nurse. On this account we find so many of such infirmities prevailing in hospitals for imbeciles, and even in grown-up persons in insane hospitals.

RHEUMATISM IN CHILDREN.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY FLOYD M. CRANDALL, M.D.,

Lecturer on Diseases of Children in the New York Polyclinic.

It was formerly taught that rheumatism was an uncommon disease in early life. It is now the belief of those who see children in large numbers that such teaching was erroneous and arose from misinterpretation of numerous well-defined symptoms. In a recent study of the etiology of chorea, I was surprised at the marked differences in the conclusions reached by various observers. One found rheumatism a cause of chorea but four times in two hundred and fifty cases; another found it in twelve per cent.; another in fifty-seven per cent. How are these differences to be explained? The conclusion is inevitable that they were due to some error in diagnosing rheumatism. Either one man overlooked the disease, or another saw it where it was not present. This leads to the question, Is rheumatism, then, so difficult of diagnosis? The difficulty arises not so much from obscurity of symptoms as from the fact that we look for the same symptoms that we are accustomed to see in the adult. It is somewhat significant that in the observations just quoted the small percentages were those of neurologists, who see little of the diseases of children. Few other diseases manifest themselves so differently in childhood and in adult life. The two little patients before us show these differences extremely well.

CASE I.—This little boy, eight years of age, gives the following history. The mother has had no definite rheumatic symptoms, but the father has suffered from two attacks of acute articular rheumatism. The patient had complained of growing pains for two years or more, but there were no definite articular symptoms until a little over two years ago. At that time he had an attack of pain in the ankles which continued two days, with slight swelling, but no redness. He continued to play about, but complained of pain and lameness. In the following

spring he had a second attack, less severe, followed by a mild attack of chorea which lasted five weeks. He has also had two attacks of sore throat, one of which was pronounced by a physician to be tonsillitis.

The present illness began night before last, following a wetting of the feet in the morning. That same night he was feverish and unable to sleep because of pain in both ankles and in the muscles of the leg. The ankles were neither swollen nor red. Yesterday he was quite lame, and complained of pain, but did not remain in bed. Last night the pain was more severe, and was located in the ankles and the right knee. There was also pain in the muscles of the thigh and calf. He was again feverish, but there was no swelling. You observe that he walks with considerable effort. There is a limping gait, evidently due to stiffness as well as pain. The mother says that he is less lame now than when he started from home. You observe that there is a little puffiness about the ankles, especially the left, and a decided tenderness on pressure. You also observe that there is some sensitiveness of the right knee, and upon pressing the tendons back of the knee there is decided tenderness. We have him again walk across the floor, and we see that the limp is due to inability or disinclination to put the heel well down to the floor. This is due to pain and tenderness of the hamstring tendons.

The facial muscles are slightly unsteady and the movements of the hands and feet are somewhat erratic, but we can hardly say that the child is now choreic. The tongue, though coated, is not the large, wet, flabby tongue so often seen in adults suffering from rheumatism. There is no perspiration. The appetite is poor. The temperature is now $100\frac{1}{4}^{\circ}$. Examination of the heart reveals a blowing mitral regurgitant murmur.

CASE II.—The second patient is a girl of eleven years, who was brought this morning for treatment of chorea which began four days ago and has grown rapidly worse during the past twenty-four hours. Since last night she has had quite severe pain in the right wrist, which is somewhat swollen and sensitive to pressure and has a faint red flush. She has been somewhat feverish, and now has a temperature of $100\frac{1}{4}^{\circ}$. She is extremely anæmic, but presents no other acute symptoms. She had chorea four years ago, lasting eight weeks, and a second attack last year, accompanied by arthritis of the ankles and one wrist. There is a blowing murmur at the apex, which is not carried far to the right and is strongly suggestive of acute endocarditis.

These cases illustrate the three most marked peculiarities of rheumatism during childhood :

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1. The symptoms are isolated and irregular in their order of development.

2. The arthritis is mild and apparently of little importance.

3. Several symptoms are common which do not appear in later life.

Symptoms that are grouped closely together in adults tend to become isolated in children and appear at varying intervals, so that the disease may consume months or years in developing all its phenomena. It pursues no fixed course; the symptoms are variable in their order of appearance and combination. In the case of the little boy we have the following order of events: growing pains followed by arthritis, and this several months later by another attack of arthritis with chorea, and still later by tonsillitis and arthritis, endocarditis having been developed during the time. In the case of the little girl the order of events is wholly different, and yet the case is as truly typical as the first and the diagnosis as undoubted.

Let me present to you a brief outline of the clinical histories of other cases of rheumatism:

1. Growing pains, followed by chorea, at five years; chorea at six years; arthritis one month later; arthritis one month later; chorea six months later; chorea four months later, with arthritis and fibrous nodules.

2. Chorea at four years; chorea at six years (no cardiac symptoms); arthritis four months later; tonsillitis with joint-pains and endocarditis three months later; arthritis four months later.

3. Chorea at six years; chorea at seven years; chorea at eight years; growing pains during three years; acute arthritis (ankles and knees), followed in one week by chorea; at nine years arthritis, three months later followed by chorea, and another attack of chorea in four months; tonsillitis frequently; cardiac symptoms (mitral regurgitation and aortic obstruction).

4. Chorea at five years; chorea fourteen months later; arthritis nine months later, with endocarditis; tonsillitis three months later.

5. Arthritis (slight), followed by chorea, at six years. Arthritis of foot at eight years; recovery; second attack of arthritis with endocarditis eight days later; sudden death.

These histories show very clearly the peculiar distribution of symptoms over long periods of time. They prove the truth of Dr. Cheadle's statement, that the history of a rheumatism may be the history of a whole childhood.

The two cases before us also show the behavior of the arthritis in children. The one characteristic symptom upon which we rely in the adult is especially uncertain in the child. Arthritis is synonymous

with rheumatism in the mind of the physician whose practice is chiefly among adults. In the child it is usually a symptom of minor importance, and may be so slight as to be entirely overlooked. One joint alone is not uncommonly involved, the only symptom being stiffness and tenderness, with, perhaps, slight swelling and redness. Occasionally a distinct attack of acute articular rheumatism is seen in a child of ten years, but it is rare. The younger the child the less marked the arthritis. Sometimes the tendons and their sheaths alone are affected. Rheumatism is, in fact, a disease characterized by inflammation of the fibrous tissues of the body. Stiffening of the hamstring tendons, as in the case before you, is very characteristic of rheumatism. The child is unable to put the heel to the ground, and hobbles about for a day or two on the toe. The attack then passes away and is forgotten, and no history of rheumatism is obtained from the parents. A peculiarity of the pain and stiffness of rheumatism in the child, as in the adult, is their increased severity after rest. They are less marked after moderate exercise, so that a child who has been limping at home in the morning often walks quite naturally when he reaches your office.

A transient but slight elevation of temperature usually accompanies a rheumatic attack. It commonly ranges at about 100° , and occasionally reaches 102° or more. Many attacks of so-called ephemeral fever are in fact rheumatic attacks. The accompanying charts show the temperature range in two typical cases of arthritis. The

FIG. 1.

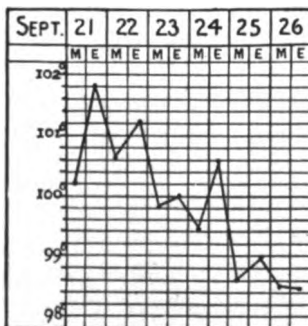
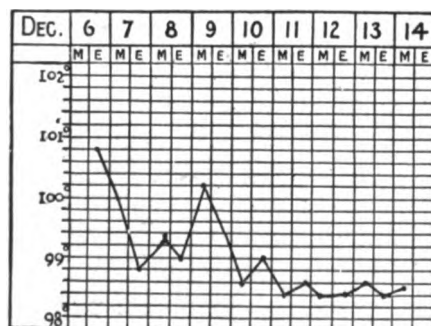


FIG. 2.



first patient was a girl of nine years (Fig. 1); the second was a boy of six years (Fig. 2). In the latter case the slight elevation of temperature on December 9 was coincident with the development of endocarditis.

Recurring tonsillitis is, without doubt, an expression of the rheumatic diathesis, but we should not be warranted in making a diagnosis of rheumatism from one or two attacks of tonsillitis alone. When it is several times repeated the suspicion of rheumatism is strong, and other symptoms of that disease will probably be found, if looked for.

Purpura is an interesting and not very uncommon manifestation of rheumatism. It is most frequent in young adults, but I have seen a well-marked case in a boy of six years. It may accompany, follow, or precede an arthritis, and is quite prone to occur independently of all articular symptoms. I have seen it four months removed from any other symptom. The spots are more common upon the ankles and the outer sides of the legs than upon the shins, and are sometimes very sensitive and painful. Urticaria is a common disease in children of rheumatic tendency, but it cannot, perhaps, be called strictly a rheumatic manifestation. The profuse acid sweating of rheumatism in the adult is rarely, if ever, seen under twelve years of age.

Neither of these patients shows fibrous nodules, which, when present, are diagnostic of rheumatism. They are small rounded bodies which develop in the vicinity of the joints. They are not tender to the touch, and cause no pain. They sometimes appear suddenly, often in successive crops, but disappear slowly, many weeks sometimes being required. They are most commonly found about the malleoli, patella, clavicle, scapula, spines of the vertebræ, extensor tendons of the hand, temporal ridge, and occiput. They may be found singly or in groups, and vary in number from three or four to thirty or forty. There can be no doubt that their external development is usually associated with endocarditis, growths of similar character appearing at the same time along the edges of the valves. It is, therefore, a symptom of the gravest importance.

It is generally admitted that there is a relationship between chorea and rheumatism. The exact nature of this relationship is still a disputed question. In one hundred and nineteen cases of chorea in which I have recorded histories, rheumatism, either antecedent, concurrent, or subsequent, occurred in fifty-four and one-half per cent. There are unquestionably several causes of chorea. It is not all rheumatic. It often results from fright alone. I believe there is a neurotic predisposing factor underlying chorea. The children in some families are almost certain to have it if they contract rheumatism. In other strongly-rheumatic families chorea never appears. There is an indefinite factor which we call predisposition. With this factor present, rheumatism, fright, hysteria, or pregnancy may act as a pre-

disposing cause. The most frequent and powerful of these is rheumatism. The neurologist who sees a strong neurotic element and ignores rheumatism, and the general practitioner who sees rheumatism and ignores the neurotic element, are both equally at fault. The two are not antagonistic, but are related as predisposing and exciting causes.

The most important element in the whole rheumatic series is endocarditis. It is due to the direct action of the rheumatic poison, and cannot properly be called a complication. It is far more common in children than in adults. It may occur with the mildest attacks, and probably in rare instances is unaccompanied by any articular symptoms. It is insidious in its onset and usually subacute in its character. It is the element which renders rheumatism a dreaded and serious disease. No rheumatic attack, however mild, should be allowed to pass without careful physical examination of the heart. If detected early, much may be done by rest, diet, and tonics to avert chronic heart-disease. The murmur is at first soft and blowing. It may disappear or become harsher and develop into a permanent murmur. The rational symptoms of endocarditis are very obscure. There may be a slight increase in the temperature, and the child may assume a restless, anxious expression, with a tendency to cyanosis. Præcordial pain and oppression of respiration are sometimes complained of. As a rule, the disease is only detected by physical examination.

Pericarditis is also a frequent accompaniment of rheumatism. According to Sturges, the most common cardiac disease of children is peri-endocarditis.

In treating rheumatism, we are not doing justice to our patients if we attempt only to control the arthritis and reduce the pain. We must not forget the most important and dangerous of its manifestations,—endocarditis. Successful treatment will accomplish four results: reduction of fever, control of arthritis, relief of pain, and prevention of endocarditis. Does the treatment by salicylate of sodium, now so prevalent, fulfil all these requirements? It certainly does not. It relieves the subjective symptoms of rheumatism more promptly than any other mode of treatment, but it does not materially lessen the danger of endocardial inflammation. A cardiac murmur will sometimes appear in a patient fully under the influence of the salicylate. I have never seen any reason to believe, however, that it increases the danger of cardiac involvement, but in large doses it is a decided cardiac depressant. The alkaline treatment is much slower, but the cure is more permanent and the danger of endocarditis is decidedly less.

A combination of the two plans would seem to offer the safest and most satisfactory method of treatment. This, in my experience, has proved to be the fact. When no acute endocarditis is present, I am in the habit of administering salicylate of sodium at stated intervals, usually every four hours, alternating it with an alkaline mixture. This is continued for three or four days. If the symptoms still persist, the salicylate is decreased and the alkali is increased. If endocarditis develops, the salicylate is dropped entirely and the alkali largely increased. To this little boy we shall give the following prescriptions :

R Sodii salicylatis, $\mathfrak{z}\text{iss}$;
 Glycerini, $\mathfrak{z}\text{ss}$;
 Elix. simplicis, ad $\mathfrak{z}\text{ii}$.
 Sig.—Teaspoonful every four hours.

R Potassii citratis, $\mathfrak{z}\text{iss}$;
 Sodii bicarb., $\mathfrak{z}\text{iii}$;
 Syr. limonis, $\mathfrak{z}\text{iss}$;
 Aquæ ad $\mathfrak{z}\text{iii}$.
 Sig.—Teaspoonful every four hours.

These are to be taken alternately, so that he shall receive medicine every two hours. If his symptoms have not disappeared when the salicylic mixture is gone, the alkali mixture will be continued at intervals of two to three hours. We shall also give him a few tablets of Dover's powder, each containing two and one-half grains. One of these may be given every four hours during the night, if the pain prevents sleep. We shall direct the mother to put him in bed and keep him there till every symptom has disappeared, and wrap the ankle in cotton batting or flannel. In severe cases I am in the habit of directing the sheets to be removed from the bed and have the patients placed between flannel blankets. When the acute symptoms have disappeared we shall give him iron and continue it for several weeks. In this case the syrup of the iodide will be the best preparation. The bitter wine of iron is sometimes preferable, and it is often of advantage to add one or two drops of Fowler's solution.

The little girl requires very different treatment. For the chorea, which is the most urgent symptom, we shall give Fowler's solution in full doses three times a day, and at the same time combat the rheumatism as vigorously as possible. Salicylate of sodium is contra-indicated because of the endocarditis. We shall depend wholly upon alkalies, and shall prescribe an alkaline mixture similar to that given to the other patient, but of double the strength. We shall also give opium in sufficient doses to relieve pain during the next forty-eight hours.

quiet are of great importance. Opium in judiciously securing this and will at the same time steady which is somewhat irregular in its action. These children should be maintained at the highest standard and should be placed under as favorable hygienic conditions as obtained. They should be warmly clothed with care but should not be confined to overheated rooms. There should be plenty of out-door exercise, conditions likely to induce rheumatism should be carefully guarded.

BRONCHO-PNEUMONIA IN CHILDREN.

CLINICAL LECTURE DELIVERED AT THE SUFFOLK DISPENSARY.

BY FRANK S. PARSONS, M.D.,

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THE patient before the class to-day is a male infant, eleven months old. He is now fairly convalescing from an attack of broncho-pneumonia contracted about five weeks ago. Some of you remember him when a very sick child at his home. His history is interesting. Born during the winter season, of healthy parents belonging to the laboring class, he received at that time the care and nursing common among people who cannot afford to employ trained help. This generally consists of the services of some kind-hearted lady friend who, from sympathetic willingness, tenders her assistance, or, for a pittance, is hired to help out in these emergencies; she often takes the child and, from ignorance of its delicate constitution, washes it in a manner most calculated to expose it to the perils of "taking cold." In this way our little patient contracted an attack of bronchitis, which, as the mother says, "hung about him all winter." Through the summer he appeared to be in good health, nursed regularly, and grew plump and strong. During the sudden changes of temperature experienced late this fall he contracted another attack of bronchitis, which, owing to the ignorance of the danger from simple bronchitis in children which prevails commonly among the laity, received no medical attention until his mother sent for us at the dispensary, some four or five weeks ago.

On examination at that time, the child had a high temperature (105° F.), a rapid pulse, rapid and labored breathing, with an incessant, short, hacking cough, marked restlessness, dulness over the lower portion of both lungs posteriorly, but normal resonance anteriorly.

On auscultation we found all sorts of râles, mostly mucous, over the chest, except over the consolidated portion, where there was sub-crepitation. A severe case of broncho-pneumonia was diagnosed, and

the mother warned of the imminent danger to the life of her child, and the importance of careful attention and faithful nursing impressed upon her.

The treatment will be discussed later on.

To-day you find the patient with more or less cough remaining and occasional bronchial râles, but on a fair road to recovery. I wish, in the first place, to impress upon you the importance and danger of simple bronchitis in children, especially in infants. Be the causes what they may, this disease always leaves an increased liability of recurrence. Secondly, I wish to impress upon you that there is nothing easier in the progress of diseases than for a severe broncho-pneumonia to grow out of a case of simple bronchitis in the young infant. In fact, practically, the former is but a severe stage of the latter, combined with the inflammation induced in the lung-substance by the mechanical irritation of accumulated mucus and other detritus at the dependent portions of the lung. Thus you see we have in this very case a history of a previous bronchitis, in all probability primarily arising from the first bath of infancy; and mark the comparative ease with which this subsequent attack assumed such grave proportions.

To appreciate the reason for this it is only necessary to review for a moment the anatomical construction of the infant lung as compared with that of the adult, or even of children over seven years of age. You will recall that the bronchial tree of the new-born has relatively larger limbs and branches than twigs and leaves, so to speak. Indeed, the air-sacs, or alveoli, are yet mere bud-like dilatations of the smaller tubes; their walls are thick and their structure is loose and yielding.

Throughout the entire bronchial tract the inner coats readily shed and proliferate their epithelium. The connective-tissue net-work of the infant lung is delicate, tending to abundant cell proliferation, and occupying relatively more of the lung-space than in the adult. The blood-vessels are loosely held in the connective-tissue net-work, and easily dilate,—thus, when over-congested, compressing the space properly occupied by the alveoli and smaller bronchioles, which may cause them to partially collapse. The muscular coats of the bronchi are weak in proportion to the youth of the child. Thus you can readily see, with all the excessive proliferation of embryonic cells that takes place in its morbid process, how serious an inflammatory attack of lung or bronchial tissue in the infant may become, while in the adult there is not only more resisting power, but less of cell proliferation to occlude the passages.

The profession generally are gradually omitting the synonymes by which broncho-pneumonia has been known, for good and sufficient reasons. Lobular pneumonia, catarrhal pneumonia, and capillary bronchitis are terms which do not quite explain the full nature of the disease, while to combine the term "bronchitis" with "pneumonia" gives a clearer idea of its pathology.

When an infant, for some cause, is attacked by catarrhal inflammation of the bronchial tubes, there is first congestion and swelling of the mucous membrane, then desquamation and rapid proliferation of embryonic type cells, which in their turn are shed. This process is especially active in infants. The bronchial secretion of mucus increases after the congestive stage, and in severe cases its watery elements are intermixed with pus and muco-pus. As the disease advances this detritus accumulates in the bronchial tubes, and, as the child grows weaker and unable to cough up all the secretion, it gravitates to the dependent portions of the chest. Thus, as most sick children lie on their backs, you will find generally the lower posterior portions of the child's lung the seat of consolidation in broncho-pneumonia. Finally, inflammatory action arises in circumscribed spots involving the alveoli and connective tissue, caused by the irritating action of the accumulated secretion.

As to the causes which primarily produce inflammation of the bronchial mucous membrane, they do not differ materially from the causes which produce simple coryza, or "snuffles." Changes of temperature, draughts, and sudden changes in the heat of rooms, combined with impure air, have much to do with the causation of catarrhal affections in adults as well as in children. This is true in the houses of the rich as well as in those of the poor. Exposure to cold and wet may occur from perspiration and soiled diapers. Constitutional diseases, prominent among them scrofula, rickets, and syphilis, are predisposing factors to bronchial affections. Probably there is no acute disease so prone to cause broncho-pneumonia and render it especially fatal as measles. Whooping-cough is also a prime factor in its etiology. Whether micro-organisms ever play a sufficiently important part, in connection with these diseases, to cause broncho-pneumonia, or whether the latter is induced merely by the presence of the morbid catarrhal deposits in the bronchial tubes, is an unsettled question; I am inclined to think the latter is the more practical view. However, broncho-pneumonia sometimes accompanies measles from the start. I well remember a case, some years since, which gave every symptom of broncho-pneumonia, with consolidation over both lungs posteriorly, but which also, on the

fourth day, presented an eruption of measles on the child's face, and caused a fatal termination that night.

I am fully convinced that another cause of bronchial inflammation in infants lies in the manner in which they receive their baths. Too little regard is paid to the delicate condition of an infant's respiratory apparatus and the sensitiveness of its skin to draughts of air. Ignorance here is not always to be blamed, for I have seen professional nurses wash infants so carelessly that the child was cold, blue, and shivering before they were through the process. I have also seen cases of broncho-pneumonia occur from such exposure in the houses of the well-to-do.

The principal difficulty in diagnosis is between this disease and croupous pneumonia. To distinguish them you must bear in mind the age of the child, for the younger the child the more apt is the disease to be broncho-pneumonia instead of croupous. There is generally a previous history of brouchitis or ill health in this disease, and often we have a history of measles or whooping-cough, while in croupous pneumonia the disease begins abruptly. The frequency of respiration is about the same in the two diseases, but is more labored in broncho-pneumonia. The expiratory moan is common to both. The temperature-rise is abrupt in croupous pneumonia, while in this disease the rise is more gradual.

On physical examination we find the consolidation, if present, over portions of both lungs, generally the posterior, owing to the custom of sick children to lie on their backs. In the croupous variety any consolidation present is likely to be found over a whole lobe, generally on one side; but it is not the easiest thing always to find this consolidation in either variety. Râles and unimpaired resonance are common to both forms of pneumonia. As children do not expectorate, but swallow the secretions they cough up, there is often vomiting of mucus and "phlegm," so called, in all diseases of a catarrhal nature of the respiratory tract. Recovery from broncho-pneumonia is by lysis, in contradistinction to the crisis of the croupous variety.

The prognosis of this disease should always be guarded. While often the sickest of children recover, yet sometimes those you think will pull through suddenly collapse.

Treatment.—A comfortable room, well ventilated, and good, cleanly surroundings, are as necessary in this disease as in any other. Care should, of course, be exercised to prevent all undue exposure to sudden changes of temperature, draughts of air, etc., which will in any way increase the danger of contracting a "cold." The sick child should

be clad in a long, warm night-dress made of soft flannel or cotton flannel, and be kept in the same, unless absolutely necessary to change for the sake of cleanliness, until the severity of the disease is past. In the first place, I am in the habit of directing, in these cases of broncho-pneumonia, that a kind of chest-protector be made from eider-down flannel, which is thick and warm, besides being very soft and unirritating. This is made out of one piece, cut of sufficient length to reach as far down as the level of the umbilicus all around; an opening large enough to slip over the head is made in the centre of the piece, and arm-holes cut out to fit; then into each of the sides are sewed some bits of tape for tie-strings, so that when applied the sides can be so fastened as completely to enclose the chest. It is well to have two or three of these protectors made, in order that one may be worn all the time until warm weather.

I am of the opinion that some such protector is of more value in broncho-pneumonia than all the poultices, ointments, or other applications that are usually employed. Regarding poultices, whatever be their value in simple bronchitis, which I believe is small, they have no place in broncho-pneumonia; indeed, I think they often do more harm than good; unless frequently changed they become cold and clammy, and the exposure necessary to change them is an unwarranted one which does not benefit the infant's condition in this disease. Counter-irritation in the treatment of catarrhal affections of the chest in children is likely to produce harm.

When called to treat such a case as our little patient here first presented, the main object in view is the relief of those symptoms that are immediately oppressing and urgent. With him this meant, first, stimulation; second, reduction of temperature; and third, attention to his cough and chest-symptoms. When we can see the case early, we often have time to confine our medication to the relief of the cough and assistance of resolution; but where the vital powers of the child are weakened, there must be some support given these by stimulation previous to any attempt to treat the cough, otherwise the child may quickly succumb to over-strain of the heart. In such cases I have been in the habit of employing a mixture of one part brandy to five parts pure boiled water, preferably hot, and of this half a teaspoonful is given every half-hour, while each hour one drop of tincture of digitalis is added. In my experience, this way of supporting weakly infants has worked remarkably well. In some cases it may be necessary to reduce the temperature by means of antipyretic drugs, and of these there is no better one than a grain of acetanilide every three or

four hours, or a small dose of aconite may be employed. These must be used cautiously in conditions of extreme prostration.

When it is necessary to give an emetic to relieve the stomach as well as the bronchial tubes of the thick, viscid mucus lodged in them, there is not a great deal of choice between ipecac and turpeth mineral. It is somewhat dangerous to give either as a last resort and when the child is already moribund, as is sometimes done; but while the baby has strength and appears to be suffering only from dyspnoea, there is often marked benefit to be derived from a free emesis.

For similar reasons a little calomel given occasionally to free the stomach and bowels from the mucous collections is often beneficial. When a cough-mixture is given, there should be a definite reason for every drug in its composition. Compounding a cough-mixture at random, with the hope of hitting something that will stop the cough, is not only an unscientific way of treating the disease, but you will be fortunate if you escape without doing harm.

Neither can one give any set rules in all cases. Stopping a cough is not the only thing to be done in the broncho-pneumonia of children; cough is nature's mode of getting rid of offending matter in the respiratory tract, and to stop it in these catarrhal diseases of children simply allows the accumulation of mucus in the bronchi to increase more and more without the necessary efforts to expel it. The first principle of a good cough-mixture in broncho-pneumonia should be some drug that will increase the watery elements in the mucous secretion, and thus render the latter less viscid. For this I generally employ ipecac. There are some authorities who do not agree with me in the propriety of stimulating the mucous glands in broncho-pneumonia,¹ but when one sees, time after time, the relief obtained as soon as the cough becomes "loose" and "raising" easy, he is inclined to place confidence in such a remedy. I do not give ipecac "to the verge of emesis," by any means, but use the wine in small repeated doses until the effect desired is manifest. Combined with ipecac, some slight admixture of opium tends to hasten the second stage, as well as to relieve the irritability of the first, and for this the combination of opium and camphor in the form of paregoric has a happy effect, partly due to the action of the camphor.

Dr. Dodge, of Kingston, New York, has said,² "the stimulating expectorants recommended by some,³ especially senega and squill, are

¹ Dr. F. G. Morrill, in *Keating's Cyclopædia*, vol. ii.

² *Journal of the American Medical Association*, December 17, 1892.

³ *Loc. cit.*

worse than useless in the early stages of bronchitis," and I might add, the same is true of their use in the early stage of broncho-pneumonia. It is a good plan to establish pretty free action of the skin and kidneys. You know that in all fever cases the high color and concentration of the urine indicate more or less tax on the kidneys, and we are apt to get congestions in them of a secondary nature ; therefore it is a good plan to encourage some diuretic action. For this purpose, if a little citrate of potassium is included in the cough-mixture the desired result is generally obtained. Therefore, for such reasons as these, our little patient received, in addition to the stimulants he was taking, the following prescription :

R Vini ipecac., ℥i ;
 Potass. citratis, ℥ss ;
 Tinct. opii camph., ℥ii ;
 Elix. simp., ℥i ;
 Aquæ destil., q.s. ad ℥iv.—M.

Sig.—A teaspoonful every two hours to an infant one month of age.

By employing the simple elixir in cough-mixtures you will avoid their becoming sour in warm rooms and summer weather, while there is no especial advantage to be gained in the use of syrups as a vehicle ; moreover, they are often so thick and sweet that they are nauseating. The stimulating expectorants, and especially ammonia, are useful in the latter stages of this disease when a free watery secretion has been established, and all that is necessary is the promotion of its expulsion from the bronchial tract.

In cases of recurring "tightness over the chest" or suppression of cough there is often benefit to be found in the boiling of water in the sick-room ; the steam arising therefrom gives a moisture to the atmosphere which favors the expulsion of the secretion by adding to it watery elements.

During the course of the disease the position of the child's body should be often changed, so that hypostatic congestion shall not take place and increase the liability to collapse.

The diet of nursing infants it is, of course, not necessary to discuss, but that of older children should be liquid and nutritious. Beef-juice, broths, and milk are essential during the disease, while the white of egg and cod-liver oil make good nutritious diet, in connection with milk, during convalescence.

Surgery.

- I. RUPTURE OF THE URETHRA FOLLOWING STRICTURE; PERINEAL URETHROTOMY; RECOVERY.**
II. LACERATION OF BLADDER AND RECTUM FOLLOWING COMPOUND FRACTURE OF PELVIS; ABDOMINAL SECTION; DEATH.

CLINICAL LECTURE DELIVERED AT THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.

BY JOHN ASHHURST, JR., M.D.,

Barton Professor of Surgery and Professor of Clinical Surgery in the University of Pennsylvania; Surgeon to the Pennsylvania Hospital, etc.

GENTLEMEN,—I want to show you this case of ruptured urethra, and say a word or two on another case which has recently been in the hospital. When this man was brought into the ward he was unable to pass his water. He had a stricture of the urethra, which was acquired some years ago, and the contraction had gradually increased until about a week or ten days before he was admitted, when he became unable to pass more than a few drops of urine at a time, while swelling of the perineal region occurred, showing that there was a rupture of the urethra behind the stricture.

In order to relieve the patient's great suffering and to empty the bladder, an incision was promptly made in the perineum, opening the urethra behind the stricture, and permitting the escape of the urine that had infiltrated into the cellular tissue. This was all that could be done for the time; the patient's immediate sufferings were relieved, and a passage was made from the bladder to the external surface, and we now have to wait until the sloughs separate and the parts return to a healthy condition, when it will be proper to see what can be done for the cure of the stricture. From the tightness of the occlusion in this case, no instrument could be introduced, not even the smallest filiform bougie, so that the operation employed was that described by Mr.

Cock as "tapping the urethra at the apex of the prostate." This operation is performed by introducing the forefinger of the left hand into the rectum so as to recognize the position of the parts, and then making a small median perineal incision, from before backward or from behind forward as preferred, ending half an inch in front of the anus. Mr. Cock employed a double-edged knife, but I ordinarily use a simple straight bistoury. This I take in the right hand, with the back of the knife towards the rectum, so as not to run any risk of wounding the bowel, and push it on, guiding its course by the left forefinger, until it punctures the urethra just at the point of the prostate, and therefore behind the stricture, which is always situated anteriorly. The knife is then drawn forward, so as to open the membranous portion of the urethra, when, if the bladder is much distended, the urine will probably immediately begin to flow. Then, still keeping the finger in the rectum, a grooved director is passed into the bladder through the perineal wound, and upon the director a full-sized flexible catheter, which is fastened in, and its end carried into a urinal kept alongside of the patient so as to keep him dry.

When the parts have returned to a healthy condition, another effort may be made to pass a small instrument through the urethra, and it often happens that in two or three weeks after the operation the stricture will be found sufficiently relaxed to enable this to be done, when the cure may be completed by the process of gradual dilatation, or, under other circumstances, by internal or external urethrotomy as may be required.

The other case about which I wish to speak to you was a much graver one than this, and terminated fatally a few hours after the operation attempted for the patient's relief. The man was employed about a mile out of the city, and was knocked down by the falling of two trees which were close together and connected by a rustic bench extending from one to the other, so that the trees were practically one: he sustained among other injuries a compound fracture of the left radius, a fracture of the right clavicle, and a compound fracture of the pelvis,—the os innominatum of the right side,—and this was followed by the loss of a large quantity of blood, which came from the rectum, showing that there had been a laceration of that organ. A catheter was introduced into the bladder, bringing away only a small quantity of bloody urine, and upon injecting a moderate amount of fluid only a small portion returned, part of the remainder escaping from the anus and making it evident that there was not only a rupture of the bladder, but a communication between the bladder and the bowel. This

was the condition in which I found the patient when I saw him last night.

With a good deal of difficulty I succeeded in getting a staff into the bladder, and then opened the perineum, making an incision as in the median operation for stone. Then, taking the staff out of the urethra, I introduced it through the perineal wound, and brought its point up in such a manner that it projected beneath the abdominal wall just above the pubis, and I next cautiously cut down upon this, so as to make an exploration of the bladder from above.

As soon as the point of the staff was exposed, it was evident that it had passed through a laceration in the anterior wall of the bladder and was in the abdominal cavity. With some trouble I now succeeded in drawing the bladder forward by means of forceps, and introduced six or seven Lembert's sutures, so as to close the rupture by bringing the peritoneal surfaces together. Protrusion of the bowels was measurably prevented by the pressure of a soft towel wrung out of hot water, and after placing a drainage-tube at the lower part of the abdominal incision, this was closed. A catheter was also passed through the perineal wound and secured in position. No wound was found opening into the rectum, and the communication between that viscus and the bladder was no doubt below the reflection of the posterior peritoneal fold.

Although this case has terminated fatally, yet I feel satisfied that the treatment was proper, because statistics show us that without an operation patients with intra-peritoneal ruptures of the bladder almost invariably die. Without operation the mortality is ninety-five per cent.,—*i.e.*, less than one-twentieth of the cases get well. On the other hand, by the operation nearly one-third get well, and instead of ninety-five per cent. the mortality is reduced to about sixty-eight per cent. Of course, therefore, as far as statistics bear on the question, the operation is justified; and indeed with such a complication of severe injuries as this patient suffered from, recovery could hardly have been expected.

EVACUATION AND DRAINAGE OF INTESTINAL CONTENTS IN OBSTRUCTION OF THE BOWELS.

BY J. GREIG SMITH, M.A., F.R.S.E.,

Surgeon to the Bristol Royal Infirmary ; Lecturer on Surgery, Bristol Medical School, England.

[A girl on whom an operation for intestinal obstruction was performed in the Bristol Royal Infirmary on October 18, 1892, was made the subject of a clinical lecture on October 21, at which period the patient was practically out of danger. The operative treatment which had been observed by the audience was explained in detail according to the principles here given. Papers on operative evacuation of intestinal contents in obstructions were read by the author at the British Medical Association Meeting in Birmingham in 1890, and at the Royal Medical and Chirurgical Society in London in 1892.]

It is probably superfluous to insist on the fact that all cases of intestinal obstruction are not fairly started on the high-road to recovery when the immediate cause of the obstruction has been removed. An operation may have been surgically perfect ; the band may have been found and divided, the gut liberated, the parietal wound closed, and the patient put to bed apparently little the worse for our interference ; but the bowels refuse to act, the abdominal distention remains, and the patient continues to sink. Although we have freed the strangulated gut, we have not relieved the obstruction. We have removed the prime cause, but not the whole cause, and the effect continues.

This secondary cause I believe to be a combination of circumstances and conditions the concrete expression of which is the presence of enormous quantities of fluid and gas in the bowels. Broadly, it may be said that the cause of the continuation of the obstruction is the intestinal distention.

It is not necessary to seek to isolate the factors at work in this chain of causation. We know that an over-distended intestine cannot pass its contents on. It may be that the long-continued overstretching has resulted in muscular paralysis,—an effect with which we are sufficiently familiar in other hollow viscera. Or it may be that the neces-

sarily acute flexures of the distended gut form kinkings or infoldings of its walls which act as valves or barriers. Or it may be a sort of abdominal asphyxia in which compression, venous stasis, or even nerve-shock takes part in producing the result. Probably a combination of these causes produces the common effect. At all events, it is, in my belief, certain that the mere fact of over-distention of the bowels, whatever other elements may be associated with the distention, may be taken as an indication that the obstruction is not overcome, and that the patient's chances of recovery are greatest when we assume the helplessness of the intestines to resume unaided their natural action, and when we relieve them of the burden they cannot throw off.

I am pleading for no new departure in practice. A bladder that is paralyzed by over-distention is relieved by the catheter, and is permitted to recover its lost powers by repeated catheterization. An overdistended stomach regains its powers after being emptied several times by the tube. A dilated and paralyzed colon regains its contractile power if it is permitted to remain empty by making an opening for the fæces above it. And the plea for interference is stronger in the case of intestinal obstruction than in any of the examples quoted. For we may sometimes empty the bladder by extra pressure over the pubes, we may empty the colon by enemata, and the patient himself may empty his stomach by vomiting; but no extraneous aid can empty the bowels, unless, indeed, we include the tedious and ineffectual aid provided by vomiting. And as, also, in general intestinal distention there is positive and acute danger to life, we cannot afford to wait; the patient will be killed by waiting.

I hold, then, that, as a part of our operation for the relief of intestinal obstruction, we ought to empty or partly empty the over-distended bowels. And, further, I hold that if the distention is very excessive, and has continued over many days, we ought not only to evacuate, but to drain away the contents. Finally, it is only a prolongation of our treatment to make drainage permanent in those cases where the prime cause is not found or cannot be removed; this is simply the formation of an artificial anus.

It will be observed that in the last instance I enter the field which is usually reserved for colotomy or allied operations. This cannot be avoided. The motive to evacuate overlaid bowels necessarily leads us among the chronic cases, and especially those in which acute symptoms have supervened upon chronic.

As I am concerned only with those cases in which over-distention of the bowels is a prominent feature, it will be seen that I exclude from

consideration a large class,—a class that may be regarded as the most hopeful. Of acute cases, I exclude all those in the earlier stages which have been observed before distention has become excessive, or in which the patient still has strength to vomit freely the fluids that are poured from the intestines into the stomach. I am doubtful whether cases of acute volvulus should not always have evacuation and drainage carried out. Of four cases which I have had to treat, in two I had to reopen the abdomen and drain, and in the other two I drained from the beginning. In subacute or chronic cases with incipient obstruction the question of immediate drainage does not arise; we here deliberately choose and carry out our method of operation. But in some such cases we are not called upon to operate till the latest possible moment, when obstruction has lasted for weeks rather than days, where distention is excessive, and where the patient is brought to the point of death. Such cases brook no delay; the bowel must be opened at once and its contents evacuated, and we must make our entrance in many such cases through the anterior parietes and not through the loin. I am well aware that inguinal colotomy is supposed to be at a disadvantage as compared with lumbar colotomy in cases where the bowel is immediately to be opened; indeed, some surgeons maintain that where immediate opening is essential, colotomy by abdominal section should never be performed. Those who hold and act up to this view must, I am confident, lose lives which others who hold the opposite view might save. The operation of *cœlio-enterostomy*—the making of an artificial opening in any part of the ileum or colon through any part of the parietes—can be done at one operation almost as safely as at two. Thus, I have made immediate openings in the transverse colon through the epigastrium,¹ in the sigmoid flexure through the linea alba,² in the middle of the ileum through the right linea semilunaris,³ in the lower ileum through the right rectus,⁴ in the descending colon through the left linea semilunaris,⁵ and all recovered from the operation. A sixth case,⁶ operated upon almost at the point of death, was found, post mortem, to have a satisfactory anus between the ascending colon and right linea semilunaris. It must be noted that in all these cases the urgency to operate was great, on account of long-standing obstruction and great

¹ A patient of Mr. Forty, of Wotton-under-Edge.

² A patient of Mr. Eadon, of Hambrook.

³ A patient of Dr. Eustace, of Weston-super-Mare.

⁴ A patient of Mr. Fowler, of Cirencester.

⁵ A patient of Dr. Shingleton Smith, of Clifton.

⁶ A case of Dr. Rossiter and others, Weston-super-Mare.

abdominal distention. I purposely exclude all cases where the urgency was not so great, and where an operation in two stages was strictly carried out.

And now to describe the methods of operation. First, as to anæsthesia. As I am convinced that prolonged anæsthesia adds to the risks, I never, except in the most favorable cases, continue its use over a longer period than the few moments occupied in making the parietal incision and placing the stitches. This is the only painful part of the operation; the rest of the proceedings can be carried out without anæsthesia; sometimes they may even be assisted by the intelligent co-operation of the conscious patient. The free ends of the sutures, gathered together in two pairs of catch-forceps, lie on either side of the parietal incision, covered up by the warm, moist sponge-cloths which lie on either side of the wound, and are not in the way of the operator.

The varieties of method may conveniently be described under the different varieties of cases; I divide them into three:

(1) Those cases in which one evacuation, performed at the time of operation, is all that is called for, and the bowel is at once returned free into the cavity of the abdomen.

(2) Those cases in which several evacuations, extending over several hours, are necessary, and the bowel is temporarily fixed in the wound, but is ultimately returned into the abdomen.

(3) Those cases in which it is necessary to provide for prolonged or permanent drainage.

In the *first* class, where a simple evacuation of superabundant intestinal fluids and gases is all that seems necessary, the proceeding is very simple. A knuckle of bowel, high enough above the seat of strangulation to be free from congestion or inflammation, is pulled through the parietal wound, and a folded sponge-cloth is wrapped around it like a bandage, leaving exposed the top of the knuckle. An assistant holds the bowel, wrapped in its covering, between the finger and thumb, which pinch the mesentery, but not the bowel itself. A small vertical incision is made through the outer coats, and a large hollow needle with rubber tubing attached is pushed through the inner coats. Through the needle and tube the intestinal contents escape, either into an open dish or, preferably, into a large exhausting receiver. If there is free and rapid escape of gases and fluids, with visible collapse of the distended abdomen, we may expect a speedy termination to our operation. But if, as is more usual, the flow after the first spurt is not very rapid, we must be prepared to wait by the side of

the patient for half an hour, or an hour, or even longer. By this time he will probably have recovered from the anæsthetic, and a few encouraging words to the effect that the cause of the obstruction has been found and removed, and that the rest of our proceedings will not be very painful, will always quiet any restlessness. While we wait for the flow to come on again, newly-warmed blankets may be placed under the mackintosh sheeting which already covers him from chin to feet, and, if we like, we may pull a chair to his side and sit down, holding the needle in place meanwhile. The fluid flows intermittently as successive loops of intestine empty themselves into the loop into which the needle enters; the reservoir is filled and the abdomen becomes flat. Meanwhile the patient is probably filling his lungs with long-drawn inspirations; a healthy color returns to his pallid or dusky cheeks, and he may be emphatic in his expressions of relief. Now we remove the hollow needle, close the opening in the bowel by a figure-of-eight Dupuytren's suture, cleanse the bowel, return it into the abdomen, and close the parietal incision by tying the sutures already placed in position.

A few hours will decide how the case is to progress. The distention will return to some extent, sometimes to such an extent as to require reopening of the wound and another evacuation. But if we have exercised a proper judgment the distention will not be severe, and will soon pass off, the bowels will probably act with abundant evacuation of flatus, and the patient is cured.

In the *second* class of cases one evacuation is not likely to be enough, and we must provide for several evacuations, or even continue drainage over several days. Here the intestines, usually through unusual prolongation of the period of distention, seem to be completely paralyzed, and they cannot even send their contents from one loop to another. Pressure on the parietes may aid evacuation, but does not complete it. Then it is wise temporarily to fix the intestine at the bottom of the wound, so that we can empty it several times and still be able to close the parietal wound over it.

For this purpose I would recommend that the gut be slung over a loop of rolled lint, which is passed through a hole in the mesentery. The supporting loop should not be too thin, as it might cut into the gut; it should be at least as thick as a goose-quill. A roll of boracic lint, around which some Chinese silk has been spirally wound, serves the purpose admirably; a covering of gutta-percha tissue fixed with chloroform is, perhaps, an improvement. The ends of the supporting loop are fixed by means of silk threads to the free ends of a belt of

strapping carried round the back and cut off at a distance of two or three inches from the wound in the parietes. The strapping is practically immovable, and the threads can be tightened or loosened at pleasure, according as we desire to pull the gut forward or let it fall backward. While the intestinal loop is pulled out the gut is emptied in the manner described for the first class of cases, and the opening is closed by suture in the same way. Then over the bowel is placed a piece of gutta-percha tissue, which is tucked in around the margins of the incision so as to prevent the formation of adhesions, and a simple dressing is strapped down over all. When distention recurs the proceeding is repeated once, twice, or thrice, or even oftener, as necessity demands. After the second or third evacuation adhesions will probably have bound the intestine to the edges of the incision ; it is best not to disturb these. I think it is best to select a new place for each perforation. When adhesions are firm, and we do not yet dare to give up drainage, a properly-shaped canula may be placed in the puncture opening and left there. I have used the tip of a No. 12 celluloid catheter, moulded in hot water, for this purpose ; but a piece of rubber tubing is what I usually insert.

When we think the patient safe we remove the supporting loop, let the bowel slip back, separating the soft adhesions or not, just as we think best, and then tie the sutures in the parietal incision.

In the *third* class the obstructing cause either cannot be found or, having been found, cannot be removed ; and here drainage, prolonged or permanent, must be provided for. The operation is then, in fact, enterostomy or colostomy, done under the stress of obstruction with great distention, which must be relieved.

The cases where the cause of obstruction is not found and not relieved are now few indeed. It were well for the patients, in my belief, that they were not so few. How much reckless surgery is perpetrated that the surgeon may escape reproach from the autopsy-maker I do not know ; but I am certain that many cases are killed by crude gropings after the cause of obstruction, which might have been saved, even if the cause had not been looked for, by a simple enterostomy. I do not advocate enterostomy for the skilled and experienced surgeon ; very rarely, indeed, will he fail of success in finding the cause of obstruction, after the gentlest manipulation. Nor do I advocate it in any case, except as the only means to save a life which would otherwise be lost.

Where the cause cannot be removed, the operation is ordinary colostomy with immediate opening of the bowel. Where we think the

cause can be removed, the operation is a temporary colostomy or enterostomy, to be completed later on when the patient is out of danger, and the abdomen is flat, by a proceeding destined to remove the cause of obstruction. This secondary proceeding will usually be of the nature of a resection of a stricture of the gut; occasionally it may be of the nature of relief given to an entangled bowel.

Supposing that we decide on the performance of enterostomy or colostomy, I still prefer the simple method of supporting the intestine by a loop or rod passed under it through the mesentery. This is essentially the method of Maydl, of Vienna, as modified by Reclus; but Mr. Allingham and possibly others, as well as myself, have been working at the subject for some years. I am in the habit of using a skewer for the pedicle in hysterectomy, around which a strip of boracic lint has been wound and fixed by a spiral of silk thread. A two- or three-inch incision is made over the seat of obstruction; a suitable loop of bowel is pulled through the opening; a hole is made in the underlying mesentery by means of a Lister's sinus forceps; the skewer is passed through this hole and its ends are laid on the parietes. Naturally we select a piece of gut that is fairly healthy; but in one case I deliberately pulled outside a cancerous growth in the sigmoid flexure, placed the skewer under it, and a few days later, when the urgency of the obstruction had been overcome by drainage, cut away, without anæsthesia, the diseased intestine. This patient, in my judgment, would certainly not have borne the operation of enterectomy in addition to that of colostomy done at one sitting; she easily bore the two operations done separately.

It is difficult or even impossible in set terms to formulate rules for guidance as to the employment of stitches between intestine and parietes. If we can afford to wait even twenty-four hours before making the opening, stitches of any sort are certainly superfluous. It happens, fortunately, that in those cases where the urgency from obstruction is greatest, the intestinal contents, even low down in the colon, are often liquid, and evacuation, with temporary relief, may be carried out by means of the aspirating-needle. Two or three evacuations through the needle in twenty-four or forty-eight hours may tide the patient over the danger, and by this time the intestine will be firmly glued to the incision and may be freely opened.

If stitches are deemed advisable, I think they are best made directly between the bowel and skin, excluding the parietal peritoneum. If the parietal peritoneum is first joined to the skin, we get the peritoneum very soon gliding over the raw surface, as peritoneum does everywhere,

with general instability at the orifice and possibly prolapse of the gut. The firmest fixation is obtained by implanting the gut directly on the raw incised surfaces, and the union is just as speedy. Indeed, as these stitches, in the presence of the supporting skewer, are not wanted to do more than appose, it is doubtful if they need be passed through the skin at all. In three cases I secured a successful result by looping the edges of the incised gut to strapping on the parietes; in four others I employed a continuous suture between the gut and the skin,—one patient dying, but not from failure in the formation of the anus. There is nothing for these stitches to do in the way of supporting the bowel,—that is done by the skewer; all they have to do is to keep the bowel in contact with the skin and so to prevent the passage of fæces into the general peritoneal cavity. In this connection it must not be forgotten that whenever we pass a silk or catgut thread there we import new risks from capillary attraction. I believe it is safer simply to pull the gut over the incision than first to suture peritoneum to skin, and then to pass a silk suture through gut, peritoneum, and skin. The peritoneal cavity is near enough to danger already, and there is no need to bring the cavity actually up to the stitches which pierce the bowel.

I would therefore venture to submit the following principles for guidance in performing the operation of enterostomy or colostomy at one sitting, when the opening is intended to be permanent.

(1) The best results, as regards both immediate closure of the peritoneal cavity and permanent fixation of the gut in the opening, are obtained by direct implantation of the gut on the raw edges of the parietal incision.

(2) If the bowel accurately fills the opening in the parietes, and is prevented from slipping backward into the cavity by a supporting rod passed through its mesentery, immediate opening and drainage may safely be carried out if the incised gut margins are placed and kept in simple contact with the skin. This contact may be efficiently secured without suturing the gut to the skin.

(3) Where the intestinal contents are liquid, free opening may, with additional security, be put off for a day or two by removing fluids through a large aspirating-needle and closing the opening in the bowel by suture.

In all these operations the dressing is important. It is arranged with the aim, first, to prevent further prolapse of the bowel, and, secondly, to avoid compression of the bowel over the skewer. To prevent prolapse, the ends of the skewer are fixed on the parietes by vertical strips of adhesive plaster, and a broad belt of the same material carried

round the back, with its free ends overlapping in front, and cut into two or more strips, which serve to hold the dressing firmly in place. To avoid compression of the gut, a small scaffolding of lint dressing is erected on the parietes around it, leaving a cavity just large enough to hold the protruding bowel. The bowel is, therefore, directly in contact with oiled silk or gutta-percha tissue.

Many details in the treatment and subsequent management of these cases might be referred to. Thus I have on several occasions gathered together bowel and skin in a continuous suture around a large rubber tube, just as we do in cholecystotomy. This is efficient enough, but any foreign body in the intestinal canal seems to cause secretion of mucus, which escapes by the side of the tube and is not readily absorbed by dressings. In dealing with the cæcum, which is not easily brought to the surface, and is often enormously distended, the skewer may be inadmissible; here I should be content with fixation by sutures; or if extra rapidity were essential, I should employ Reclus's method on the lower ileum. In one case the patient was so enormously fat that to bring a portion of the intestine to the surface in the lumbar, inguinal, or hypogastric regions would have been impossible; and here I opened the transverse colon above the umbilicus, but found the gut so greatly thinned and distended that I did not dare to use the skewer, but had to be content with stitches. Many other peculiarities in detail might be referred to, but I must rest content with this description of leading principles and practices.

In conclusion I may be permitted to remind you that I am pleading, not for a routine treatment in ordinary cases of intestinal obstruction, but for a special and superadded treatment intended to overcome one grave complication of the disease. And I would further remind you that the measures recommended have to be carried out gently and speedily on a patient who is not in a condition to bear elaborate surgical handling. The methods are tempered to the tolerance of the subject, and if they entail, as I admit they do, much increase in the labor and anxiety of the surgeon, they will be none the less favorably received on that account, if their employment can show a saving of human life, however small it may prove to be.

SARCOMA ARISING NEAR KIDNEY; TREATMENT OF SHOCK; EXPLORATORY INCISION IN JAUNDICE; THORACOCENTESIS.

CLINICAL LECTURE DELIVERED AT THE WOMAN'S HOSPITAL, PHILADELPHIA.

BY JOHN B. ROBERTS, A.M., M.D.,

Professor of Surgery in the Woman's Medical College of Pennsylvania.

SARCOMA ARISING NEAR THE KIDNEY. ATTEMPTED EXTIRPATION.

THIS colored girl, aged eight years, was admitted to the hospital a week or so ago with a large tumor occupying the right side of the abdomen. There appeared to be a history of tuberculosis in the family, but the swelling of the abdomen for which the child was brought to the hospital seemed to be a sequel to an attack of typhoid fever in the July previous to her admission. She had lost flesh and strength, but did not appear to suffer from pain in the tumor. On examination the urine showed no sugar, no albumin, and a specific gravity of 1020. The stools were clay-colored, but there was no evidence of marked jaundice.

On account of her weakness she was put upon quinine and whiskey. The tumor was large and extended much below the ribs on the right side of the abdomen; it was obscurely fluctuating and smooth in outline. At first it was thought to be an abscess of the liver, but the diagnosis was reserved. Her pulse is never below 100, and even reached 140 upon one occasion since she came under my observation. The temperature is usually about 100°, though it has been up to 104.6° and down to 98.6°.

To-day I shall make an exploratory incision, and, if possible, remove the growth. A two-inch incision above the umbilicus to the right of the median line is made directly over the tumor. Universal adhesion of the surface of the tumor to the peritoneum has occurred. Before breaking up these adhesions I shall puncture the tumor immediately under the incision, to determine whether it contains pus or other fluid.

A small trocar and canula are used. No fluid escapes, however, and it is thus determined that the tumor, instead of being an abscess or of a cystic nature, is probably a very vascular, malignant growth. These growths are so soft that they give the sensation of obscure fluctuation. The trocar is accordingly withdrawn and an incision made into the tumor, into which I carry my finger. I find that the tumor consists of a mass of pale, friable tissue, similar in feeling to a sarcomatous growth.

The abdominal incision is now increased in both directions, thus extending from an inch below the ribs to within an inch and a half of the iliac crest. I next make a transverse incision from the vertical one, extending across the abdomen towards the left, and situated about half an inch above the navel. This large, gaping wound enables me to examine the attachments of the tumor more satisfactorily, and will give me an opportunity to separate adhesions and attempt the removal of the growth. I now discover that the mass is not attached to the liver, but lies behind the posterior layer of the peritoneum, which was pushed forward by the growth. Adhesions have occurred between the surface of the tumor and the intestines and other abdominal organs. It is evident that it will be impossible to extirpate the growth without sacrificing the child's life from shock and hemorrhage. Hence I abandon the extirpation, after separating some of the adhesions to prove to myself that enucleation is impossible.

The abdominal cavity is washed out with hot water, and the free oozing from the separated surfaces treated by packing gauze down alongside of the tumor and letting the end of the gauze come out of the wound. The remainder of the external incision is sutured with silk. The ordinary antiseptic dressings are applied and measures to lessen shock carried out. The patient's condition is desperate, but under careful and watchful treatment she will perhaps react.

This case gives me an opportunity to say a few words concerning the treatment of surgical shock, which occurs after accidents, injuries, and surgical operations. Such procedures as you have just seen nearly always give rise to surgical shock, which requires much more active treatment than the slight shock which occurs in accidents, injuries, and operations of less severity. The most important requisite in severe shock is to preserve quiet of mind and body. The patient should be kept in the recumbent position, with artificial heat applied to keep up the temperature. Cardiac stimulants are demanded in the majority of cases. Heat is maintained by a warm room, hot blankets, and rubber bottles or bags filled with hot water. In some cases hot-water enemas are useful. Hot baths in which the temperature of the water is gradu-

ally raised from 98° to 110° may be valuable, although this method is rather difficult of application. From half an ounce to two ounces of brandy may be administered by the stomach or by the rectum in divided doses. The rectum should be used if the stomach is irritable, which it is likely to be in operations done under ether. By the rectum larger doses should be given than by the mouth.

In shock following accident it should be remembered that alcohol is nearly always given by the by-standers before the surgeon sees the case, and that it may have been taken as a beverage before the accident; therefore, overdosing the patient with alcohol as a remedy for shock is possible. In treating shock it is necessary to watch closely the pulse, as it increases in force and diminishes in frequency as reaction begins. It may require several hours, perhaps a day or more, for a patient deeply shocked to react fully. During this period the patient should usually be kept recumbent, with the feet higher than the head, in order to send as much of the blood to the brain as possible. Tincture of digitalis, carbonate of ammonium, strychnine, quinine, and similar drugs are to be used during the period preceding reaction. These drugs may be given hypodermically or by the mouth. I do not believe in administering alcohol immediately after etherization, because the physiological effects of ether and alcohol are identical, and therefore the prostration belonging to etherization which is associated with shock would only be increased by the administration of alcoholic stimulants.

In shock from operation I rely more particularly upon quinine by the rectum, digitalis, strychnine, and upon the hypodermic injection of morphine (gr. $\frac{1}{4}$) and atropine (gr. $\frac{1}{100}$), which I usually administer about a quarter of an hour before ether is administered. Nitrite of amyl and nitro-glycerin have recently been advised as remedies for severe shock, because of their action upon the capillaries. As surgical shock seems to be a condition of the vaso-motor centres and causes the blood to be driven to the internal organs and away from the peripheries, I am inclined to believe in these remedies as possibly useful.

Injection of sterilized salt solution into the subcutaneous cellular tissue of the chest and abdomen, by means of a large hypodermic needle and a syringe, is valuable in cases of shock in which there has been abundant coincident hemorrhage. The application of Esmarch's rubber bandages to the legs and arms, so as to drive the blood from the limbs to the brain and other viscera, is especially valuable when hemorrhage has been profuse after operation, injury, or labor. This is called "auto-transfusion." The bandages are to be left on for an hour or more, and then to be removed slowly and one at a time. If rapidly

removed, the sudden flow of blood into the limbs would cause anæmia of the brain and cord and perhaps immediate fatal results.

[The tumor continued to increase, finally burst through the wound before it had healed, and became a large fungating mass. The child died three weeks later, having existed much longer than I thought probable from the extent of her emaciation and the rapidity with which the tumor increased in bulk.

It was at first believed by the pathologist who made the microscopical examination from fragments torn away by my finger that the growth was a myofibroma, but examination after its removal at the autopsy showed it to be sarcomatous. It was evident, therefore, that some muscular tissue had been contained in the portion torn loose at the time of the operation. The diagnosis of myofibroma would not have been made had the microscopist been familiar with the clinical history of the case.

The autopsy showed the lungs and heart to be not especially abnormal; the stomach and spleen were uninvolved by the disease, while the liver was adherent to the neoplasm over a large extent of its surface. Adhesions were also found between the tumor and the intestines. The right kidney was found to be the organ from whose neighborhood the neoplasm had developed. The growth itself was about seven inches in diameter and firmly adherent to the posterior abdominal wall and the spinal column. It was at the time of the post-mortem in process of degeneration at various points, so that in the attempt at removal broken-down and degenerated structure oozed from it. It was evidently a malignant growth behind the peritoneum developing from the suprarenal capsule, the connective tissue about the kidney, or from the kidney itself. It is probable that the origin was not in the kidney structure, as no urinary symptoms pointed in that direction even when the child was admitted for treatment. It was difficult to determine at the autopsy, or by examination of the specimen afterward, the primary site of the growth. Microscopic examination made of the growth after death proved it to be sarcomatous. The small pieces detached with my fingers from the interior of the tumor at the operation had deceived the microscopist, and were probably portions of muscular tissue derived from the structures involved in the rapidly-growing neoplasm.]

EXPLORATORY INCISION IN A CASE OF JAUNDICE. CHRONIC HEPATITIS FOUND. RECOVERY UNDER MEDICINAL TREATMENT.

Mrs. M., aged forty years, says that she was never sick until she had an attack of epidemic influenza over a year ago, at which time she suffered a great deal in the region of the liver, but the suffering was not spas-

modic. She has had diarrhoea for a long time, which continued when she recently applied for treatment.

About five months since the entire surface of her body became yellowish, and the discharges from her bowels were of the same color, becoming later of a putty color. She is now quite jaundiced, and the skin itches intensely. The urine shows biliary pigment, but no sugar and no albumin; she passes about thirty ounces in twenty-four hours. She was ordered nitro-muriatic acid baths, and the solution of the iodide of mercury and arsenic, five drops three times a day, and a teaspoonful of phosphate of sodium before breakfast. This treatment was continued until about two weeks ago, without much change in her condition. The color of the integument remained about the same.

I saw the patient at this time, and advised exploratory operation, as medicinal remedies did not seem to be beneficial. I concluded, however, to wait awhile before taking any decided step. She was accordingly put upon iron and quinine as tonics, and given milk punch. Bromide was administered at night when she was not sleeping well. Massage over the hepatic region was continued. Bran baths with inunction of carbolized cosmoline were employed.

Finally, an exploratory incision was made before you over the liver to the right of the median line. An incision two inches in length gave an opportunity for inspecting the appearance of the liver. The surface of the liver was mottled in appearance, and the organ greatly enlarged, extending almost to the navel. There were no adhesions between the abdominal wall and the liver, and no tumor was found. The lymphatic glands in the neighborhood of the liver were enlarged. The gall-bladder was empty. There was no evidence of pressure upon any of the gall-ducts. A diagnosis of chronic hepatitis was made, and the wound closed with ordinary catgut and silk sutures, catgut being used for the peritoneum and silk for the muscular tissue and skin.

It is recorded that two days later the patient had no itching of the skin, and three days later the stools were dark-brown in color. It is but just to say that a few days before operation the notes say "the patient was getting paler, and that the itching was somewhat relieved by cacao-butter used with massage."

A week later the patient was given five drops of the solution of iodide of arsenic and mercury three times a day, and the inunctions of carbolized cosmoline were continued.

About one month later the following prescription was given :

Ox gall, ʒi;
Extract nux vomica, gr. iii;
Aloine, gr. vi.

Made into twelve capsules, and one given at bedtime.

From this time the jaundice disappeared gradually, and the woman was discharged improved. She subsequently recovered completely.

This case is an illustration of the difficulties in diagnosis of chronic liver-disease. For weeks the woman showed no special improvement under medicines, yet she promptly improved after a simple exploratory operation. It is in all probability a coincidence, for there is no good reason, I think, for the operation benefiting her. Of course it is possible that the manipulations about the liver and gall-bladder made in the exploration may have caused the dislodgement of some obstruction in the ducts.

THORACOCENTESIS.

This colored woman was admitted to the Woman's Hospital on November 9, with a history of gastro-intestinal catarrh, together with asthmatic symptoms which led her to believe that there was some disorder of the chest. On examination, there was evidence of pleurisy on the left side, with absence of cough or pain. A large amount of effusion occurred in the left pleural cavity, which did not yield to ordinary treatment.

On the left side the parietes of the thorax is distended and the intercostal spaces are prominent and bulging. We get absence of the usual breath-sounds on auscultation over the affected part; and on percussion the chest is very dull, while on the right side we get the normal percussion resonance. There is bulging of the left side of the chest. We have here a pleuritic effusion, and the bulging of the chest is due to the large amount of fluid in the pleural cavity. It is my opinion that there are several pints of fluid here. The left pleural cavity is enormously distended, and the effusion is pressing the left lung upward and the heart over to the right side. Thus the right lung is also encroached upon to a certain extent.

The pleural sac consists of two layers, a visceral and a parietal; the cavity between these two layers is the pleural cavity. On one side the pleural cavity is of the normal shape; on the other the layers are inflamed and so greatly distended with fluid as to exert pressure on the heart and lungs and produce a bulging of the chest. The fluid in the pleural cavity has pushed the heart and left lung upward and towards the right side, and the heart has pushed over the right lung to a certain extent, and the patient breathes with difficulty.

We are not enabled by any physical signs to determine the nature of the fluid, and whether the effusion is serous or purulent cannot be known until we introduce a hollow needle. The treatment will consist in tapping the left chest. If the fluid is serous we shall be content to withdraw as much as we can, and then administer diuretics, absorbent remedies, and salines. If it is purulent, we shall have to insert a drainage-tube and allow opportunity for washing out and draining the pleural sac. We shall give no anæsthetic, but use a small piece of ice, sprinkled with salt, applied to the side, which device will cause local anæsthesia by freezing.

The hands and everything which we use must be thoroughly antiseptic or aseptic, because if the effusion is serum and should meet with any germs from my hand or through the medium of the instruments it will become purulent.

In thoracocentesis the best place to tap the chest is in the median axillary line in the intercostal space between the fifth and sixth rib or the sixth and seventh rib. The skin must be well sterilized with a solution of bichloride of mercury, one to one thousand. This is especially important in this case, as the surface has been blistered, leaving a superficial excoriation which is probably septic. It is probable that the fluid is serous, and we will therefore use the aspirator before resorting to incision. The air is withdrawn from the bottle and the wall punctured with the capillary trocar, the stop-cock which is connected with the bottle and trocar is opened, and the fluid is drawn into the bottle.

I take a point about the median axillary line in the intercostal space just below the fifth rib and simply thrust the needle in. You now see the fluid running into the bottle. It is only serum, but if it should come in contact with any pyogenic germs, through the medium of my hands or any instrument or cloth in use, it would become purulent. From this you can understand the great importance of scrupulous antisepsis and asepsis. The fluid flows freely, and when it is nearly all drawn off the patient will breathe very much more comfortably. Any amount of fluid which is not drawn off with this aspirator will probably be absorbed later, on the application of the usual remedies.

Her breathing has already improved, and the chest rises and falls almost as it should in normal respiration. Before we commenced operating, the inspirations were short, frequent, and labored; now she breathes with moderate comfort. There is inflammation of the parietal and visceral layers of the pleura, the entire pleural sac being involved, and the pleural cavity—the cavity between the visceral and parietal

layers—is the place from which the serum comes. If we succeed in evacuating the contents of the cavity, the pressure will be removed from the lungs and the heart, and they will come back to their normal positions. As the fluid is withdrawn and the lung descends, it may come in contact with the point of my needle. This fact will be evidenced by the patient showing signs of sharp pain near that region, and will be an indication for withdrawal of the needle.

The tubing should be of rather small diameter, because the rapid flow through a large tube might cause collapse. The needle is held very firmly in the hand, and at the same time I keep the skin pinched well around the needle, so that the point shall not move nor germs get access to the chest alongside of the needle.

There is now evidence of contact of the lung with the point of my needle, and I shall therefore withdraw it about three-quarters of an inch. The patient is thoroughly comfortable now. You can see just above the mammary glands how the chest rises and falls as the woman takes a long breath.

I am inclined to think that the heart has moved about two inches over towards the left side and will soon be in its proper place. The bulging of the chest has disappeared, and I can now count her ribs. Before the operation this could not be done. We have now withdrawn nearly all the fluid, but there is still possibly one-half to one pint of fluid in the cavity; but we shall give it a chance to be absorbed. I shall remove the needle, which has been inserted three inches deep, wash the wound thoroughly with bichloride solution, and make a dressing of collodion and iodoform.

If on exploration we had found pus, I would have made an incision long enough to admit of the passage of my finger and would have inserted a drainage-tube into the cavity.

The operation of thoracentesis accomplishes the removal of the mechanical obstruction to breathing, and should be performed in the most aseptic and antiseptic manner possible, taking all precautions necessary against dangerous results. This operation should not be delayed too long. Try medical treatment, usually for three or four weeks, and then if the fluid is not absorbed you should tap the chest. If you have a large serous effusion of the pericardium, the longer you wait the more serious the case becomes, and operation by tapping is more quickly demanded than in pleural effusion.

BRANCHIAL CYST; BILATERAL SCIATIC NERVE STRETCHING.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

BY ROSWELL PARK, A.M., M.D.,

Professor of Surgery in the Medical Department of the University of Buffalo,
New York.

GENTLEMEN,—This patient I purpose operating on later this morning, but I want you to see him first and notice this tumor on the side of his neck. Here is a growth over which the skin is movable, while the tumor itself is perfectly movable over the underlying structures. The question arises, What is its nature? The boy is of Polish parentage, and the mother does not seem to have more than the necessary legal amount of intelligence, and I gather very little definite history from her, save that the boy is seven years old, and that the tumor has existed for at least six years, if not from birth. The duration and the slow growth of the tumor and its lack of adhesion would set aside the idea of malignancy. For the same reason we can dismiss the idea of an abscess or an inflammatory growth, for I cannot imagine even a cold abscess growing so slowly as this has and not forming adhesions to the surrounding parts. We have to think, therefore, of benign tumors, of which the fatty, cystic, fibrous, and fibro-cystic are the most common. It is a little too firm in consistence to make it likely that it is fatty, and a lipoma would probably have grown more rapidly than this has done, for it seems to have developed simply with the growth of the child. It is not hard enough to make me think of a pure fibroid tumor. It is somewhat soft, and on palpation it yields a sensation of pseudo-fluctuation. In other words, it gives to my fingers the sensation of either a cyst with very thick walls, or, what is more likely to be the case, a combination of a number of cysts held together in a fibrous matrix, which we ordinarily speak of as fibro-cystic.

These diagrams are the representations of the human embryo at about the third or fourth week and the sixth week respectively. You

will see by reference to the first diagram that the parts are developing at the sides and coming together in the middle line, so as to form a number of arches in the region of what is to be the neck, and gradually approaching each other in the middle line, as seen in this other diagram. This upper pair of small projections will form the maxillary processes, which fuse together in the middle line. The upper portion, which is here relatively large, does not grow as rapidly, but develops later into the nose. Different names are given to these arches,—branchial arches, oral or post-nasal arches, pharyngeal processes or arches, or mandibular arches,—because one particular arch forms the lower jaw. There are, finally, five of these pairs of processes, which, however, as they grow larger fuse together, and the distinction into five is soon lost. In the embryo at the sixth week you will see that the fourth and fifth arches have become fused together. The first of the oral or mandibular arches forms the lower jaw. There is a little, cartilaginous rod, called Meckel's cartilage, from which is formed the stylo-maxillary ligament, and the stapes, one of the small bones of the ear. The next arch goes to form the superior cornua of the hyoid bone and the stylo-hyoid ligaments, while the third arch forms the body of the hyoid bone. The fourth and fifth arches are lost in the development of the front of the neck.

Between the arches are spaces known as branchial or pharyngeal clefts, and they correspond after a fashion to the branchiæ or gills of fishes, which are in a sense respiratory organs, but which have lost all their purpose in the mammal. It is now well known to embryologists that we have frequently to deal with some failure either on the part of these branchial arches to develop, or on the part of the clefts between them to close, and that, as a consequence, we have certain congenital defects in the neck, mostly tumors or fistulæ. I consider that the tumor in this case is an outgrowth from one of these pharyngeal clefts, originally very small, perhaps not as large as a pea, but containing mesoblastic, epiblastic, and, possibly, hypoblastic tissue capable of developing into a fibro-cystic tumor. Such tumors are sometimes called branchiogenic cysts. They are at first innocent anatomical curiosities, departures from the normal standard, however, which may later form a positive menace to life, and which must, therefore, be removed.

These tumors do not always present in the neck in this way. They may be found in the middle line of the body (Fig. 1), either anteriorly or posteriorly, and sometimes very large cysts are formed, which grow in various directions. Years ago I had occasion to operate on a little boy, nine or ten years of age, upon whom Dr. Miner had operated



FIG. 1.—Branchial cyst of the neck.

previously, removing a large cystic tumor from the neck, and so much of it as was removed from that region did not return, but another cystic tumor developed, which extended underneath the clavicle and into the axilla. The child had a pouch, which he could make bulge in the neck by bringing the arm to the side, or by pressing on the neck the fluid would distend the sac in the axilla. This was another form of branchiogenic cyst or cysts, and to this condition is sometimes given the name hydrocele of the neck. In some of these tumors the cystic element is almost altogether lost, and the growth becomes quite solid, and on examination it is seen to be composed almost entirely of fibrous tissue. Although varying widely in consistence and texture, these tumors are of the same origin.

As far as operative technique is concerned, there is no particular difficulty, except that on the inner side they are almost always intimately attached to the carotid sheath and fasciæ over veins and muscles, so that unless the dissection is made carefully there is a possibility of air-embolism occurring from cutting into a vein. This danger, however, is not great enough to deter us from operating in any case, as air-embolism is an exceedingly rare occurrence.

[On operation, later in the morning, the cyst proved to be multilocular, as had been diagnosticated, and it was extirpated without particular difficulty, although by its removal an extensive dissection of the upper lateral region of the neck was necessitated. The cyst was found firmly adherent to the carotid sheath, as such tumors so often are, and yet it was not of itself particularly vascular, and its removal entailed comparatively little hemorrhage. The wound was closed with buried sutures without provision for drainage, since no septic matter had been introduced, and since the wound contained no tissue that must come away by sloughing. The wound healed by primary union.]

BILATERAL SCIATIC NERVE STRETCHING.

This young man has suffered for months with pain about the hip, felt somewhat in the front of the thigh, but for the most part down the course of the great sciatic nerve. There is no history of traumatism to account for this. He has been treated for rheumatism and neuralgia, has taken a large variety of drugs from various physicians, and has been sent in here by his last physician, still suffering and still unable to work. There is not much difficulty in diagnosing the case as one of sciatica, but I can give you no explanation of its origin other than the hypothesis that it is due to a neuritis. If we suppose a neuritis, especially one involving the upper part of the great sciatic

nerve and the plexus extending to the spinal cord, or by reflex action involving the centres of other nerves which are given off from the same plexus, we shall have no difficulty in explaining his wandering and somewhat indefinite pains; for example, those down the obturator or cutaneous nerves. But the majority of his pains originate from the sciatic nerve alone.

Inasmuch as he has had so much medicinal treatment without help, I have offered him that surgical relief which has succeeded in a great many cases,—namely, nerve stretching or elongation. This operation has been done by myself in this clinic-room about twenty times within the last few years. It consists in cutting down on the trunk of the sciatic nerve, isolating it from its surroundings, and giving it a vigorous stretching. Nerves in the active living condition are very strong cords, which will stand an amount of tension that would astonish you if you were not familiar with the facts of the case. The great sciatic nerve of the average adult will stand a tensile strain of one hundred and eighty pounds before it will break. That does not mean a jerk of one hundred and eighty pounds, but a steady pull. That is to say, one could lift the average individual by his sciatic nerve without rupturing it. We do not endeavor to do this in the operation, but we do lift the limb from the table by the nerve, thus subjecting it to a strain of forty or fifty pounds.

We are unable to explain exactly why this stretching relieves the pain of idiopathic neuralgias, but it is reasonable to suppose that so much mechanical interference sets up a change in nutrition, perhaps inducing congestion where there was anæmia before, or it may alter the nutrition in some unexplained way. It may tear nerve-fibres loose from their sheaths, thus releasing them from adhesions which were pulling on them, or from inflammatory products which were pressing on them. After the operation the parts are united aseptically and the limb put at rest, dressing it on a splint if necessary. In every case which I have seen there has followed more or less temporary paralysis. Upon recovery from anæsthesia, there is both motor and sensory paralysis of the parts supplied by the sciatic nerve, continuing from two to four days, and then sensibility and motor power gradually return, and in about two weeks, sometimes much sooner, the function of the nerve is completely restored. Facts correspondingly identical obtain in the case of other nerves, and there are scarcely any of the large nerves of the body which may not be exposed and which have not been stretched for this purpose. I have myself stretched the great sciatic, the anterior crural, various nerves of the brachial plexus, the external popliteal or

peroneal, the facial, the individual branches of the trifacial, and the spinal accessory.

This patient's case is peculiar in one respect, that he suffers from sciatica on both sides, the symptoms alternating irregularly in the two limbs. This would have been explained by a neuritis higher up or a corresponding lesion of the spinal cord. The indication, therefore, would be to stretch both sciatics. I have never known of any unpleasant consequences to follow this operation. The results have been, so far as I have been informed by patients, uniformly good.

We get at the nerve at a point midway between the tuberosity of the ischium and the great trochanter of the femur. The incision is begun at the lower border of the gluteus maximus; ordinarily there is no indication for passing through the fibres of this muscle. The incision is carried vertically down the thigh for a distance of three or four inches, varying according to the thickness of the tissues overlying the nerve. It is very easy to mistake the biceps tendon for the nerve, and I know of one gentleman who once stretched the tendon vigorously instead of the nerve. It is my custom, in order to avoid this accident, to isolate both the nerve and the tendon. We stretch the nerve both upward and downward.

[The operation was done by Dr. Park and Dr. Parmenter simultaneously on the two limbs. The wounds were made and the nerves exposed and stretched according to the method described. The field of operation was then sprayed with hydrogen peroxide solution and the wound closed with catgut and dressed aseptically. The result in this case was ultimate recovery, although the relief did not come so rapidly as is usually the case.]

PAINFUL CICATRIX FOLLOWING AMPUTATION OF A FINGER; INGROWING TOE-NAIL; TREPHINING FOR EPILEPSY; NEPHRECTOMY FOR TUBERCU- LAR KIDNEY.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY ARPAD G. GERSTER, M.D.,

Professor of Surgery, New York Polyclinic; Visiting Surgeon to the German and
Mount Sinai Hospitals.

GENTLEMEN,—You see in this patient a painful scar following amputation of the index finger. This was not an amputation at the joint, because the head of the metacarpal bone was also removed. You notice here that the cicatrix is not movable; it is attached to the bone. Painful cicatrices have, as a rule, this relation. Such cicatrices are especially troublesome upon the lower extremity, where they interfere with locomotion and incapacitate the sufferer for work. Such painful cicatrices are most apt to come to the notice of the general practitioner. Their cause is undoubtedly the fixing of certain nerve-endings in the cicatricial tissue. Where union is primary and the nerves are divided high up, there is but little danger of this complication. In such cases the cicatricial tissue is itself represented by a mere film of lymph. How different are the conditions in secondary union by granulation! Here we have short flaps, and the nerves divided at the level of the wound, so that the cut end easily becomes embedded in the massive cicatrix. If then we have constant impact from locomotion, or from grasping in the case of the fingers, excessive pain is induced. The operation in this case, however, was done only one month ago, and it would be premature to do a second operation now for his relief. We shall rather hope that with the improvement of circulation part of the cicatrix will be absorbed, and that he will in that way get rid of the stitching pain of which he complains.

Suppurating stumps are apt to become painful, also stumps in which the cut end of the bone is near the surface. Here the muscles, nerves,

tendons, and skin form one mass, and the end of the bone is attached to the cicatrix.

Occasionally we have other instances of painful stump in which the technique was unexceptionable. The flaps were good, the section was uniform, and union was early. The pain is here of the neuralgic type. It is not necessary to touch the cicatrix at all. A touch or shaking of the limb will bring on the pain. The limb will not bear contact. We have in these cases a peculiar alteration of the nerve-endings. In the ordinary stump the cut nerve tapers off, and atrophies, and axial matter is absent from the part fixed in the cicatricial tissue. In the condition we have just described the end of each cut nerve is bulbous, club-shaped; or we may have two or three nerve-endings confluent in one mass. Formerly, pathologists supposed that these neuromata were composed only of nerve-matter. We now know that the neoplasm is composed mostly of connective tissue. It is similar in character to those painful fibromata of the skin which when touched send a pain through the system like an electric shock. These fibromata of course contain nerve-endings.

To treat these cases, re-amputate, excise the cicatrix, cut within healthy tissues, make your incision funnel-shaped, so that the bone shall project freely into the wound, with the knife dissect up the tissues from the bone for a distance of one and a half times the diameter of the limb, then peel up the periosteum from the bone for this distance, and turn it back as a cuff, or, if this is difficult, make two flaps of it, an internal and an external, or an anterior and a posterior. Now saw off the bone at the bottom of the wound, and turn back the periosteum and cut it off, reserving only enough to meet over the divided surface of the bone. Stitch this together over the bone and unite the soft flaps. This is usually a successful operation. There is but little danger connected with it, and yet it relieves a great deal of suffering. I recall a case which more than twenty-four years ago used to go about Vienna. This patient had had four amputations for a painful stump, and had consumed enormous quantities of morphine. Mutilation followed mutilation, every one with temporary relief, but every time with a return of the condition.

We have a third class of cases, neurotic cases, cases with epilepsy, hysteria, idiocy, or other brain-trouble in the family history. Here the pain referred to the stump simulates a neuralgic attack, but there is an entire absence of objective elements to account for the condition, and you can mutilate the entire body without producing a cure. There is a case of this kind in this city upon which eleven operations have been

done. They began with the metatarsal bone, then the tarsus was removed piecemeal, then the ankle, then the leg, and finally the thigh, so that there now remains only a short stump. Such a patient will obtain relief for perhaps three or six months after operation, but the pain will always return. I find in the morning paper a reference to a familiar case, a regular hospital rambler, in Betsey X., who came to me among other doctors on account of a needle which she said she had got into her knee-joint. She was at the time behaving so that it was impossible to exclude a foreign body in the knee, so I opened the joint, inserted my finger, found nothing, and closed it again. The wound healed by first intention. This was five years ago. She still persisted in the statement that she had a needle in the joint, and she went to other doctors. She was cut again, and this time probably without strict antiseptic precautions, for a fistula resulted, and in the course of time the thigh had to be amputated. This morning she is reported as crazy. Even at that time she showed a remarkable facility in getting out of any variety of restraint. When you find a patient who delights to be under the surgeon's knife, who enjoys the beatitude of being an object of pity, put no confidence in the statements of that patient, or at least do not base an operation upon such statements if you can help it.

INGROWING TOE-NAIL.

The next case is one of ingrowing toe-nail. I do not consider every case of ingrowing nail necessarily a case for operation. I have cured without operation even very bad cases where the patient had the leisure and could afford to pay for treatment. Such a toe must be dressed every day. The patient must abstain from walking, and must keep the foot elevated. In the laboring man these conditions cannot be realized, and the treatment requiring the briefest incapacitation is the most satisfactory. The nail is in these cases undermined, practically detached, and there are œdema and hypertrophy of the integument adjacent to this undermined area. First disinfect the part, then with the knife slit up a flap of this hypertrophied tissue, cutting from the proximal end. Remove the flap as far as the root of the nail. Detach the damaged portion of nail with a scissors and remove with a dressing-forceps, scrape away all granulations and apply your dressing. This is all done under artificial anæmia and local anæsthesia; it is borne very well by the patient. Formerly the usual method of treatment was to grasp the nail and tear it out,—one of the most painful procedures possible.

A certain amount of your success with this operation will depend upon your dressing. After thorough disinfection apply a film of iodoform, and over this a strip of well-disinfected protective or rubber tissue. Over this apply iodoformized gauze and another layer of protective, so that the dressing shall not get dry. I sometimes order a weak solution of corrosive sublimate, one to five thousand, or a one-half per cent. carbolic acid solution, and have a teaspoonful poured over the dressing every half-hour. Do not compress the toe too much with your dressing. I have seen gangrene produced by too great zeal on the part of the youthful practitioner in such a case. If a little blood does soak through the dressings no harm will be done. At the end of three, four, or five days the first dressing is removed, and you will then find a clean wound commencing to cicatrize along the edges, and in a fortnight or three weeks the healing will be complete. I have never had relapses after this operation. After incomplete operation relapse is very frequent. To prevent slipping of the dressing, carry your bandage above the ankle. The patient can go out and attend to his business three or four days after this operation, and the result is permanent.

TREPHINING FOR EPILEPSY.

I have to report that the case upon which we performed the operation of trephining for epilepsy one week ago last Monday is doing well. You will recall that there was at first a considerable rise of temperature, due to insufficient drainage, which was relieved when, upon the removal of the plug of gauze, a half-ounce to an ounce of bloody serum was discharged from under the scalp.

The patient is now comfortable, his temperature is normal, and he has had no epileptic attacks since the operation. This fact is not so important, however, as the attacks had not previously been frequent.

The case is itself not so convincing as the one upon which I operated a short time ago. This case was that of a boy of seven or eight years, who had twenty to thirty spasms daily, some of these of such violence that the boy would fling himself from the bed to the floor, into the fireplace, or even on the stove, several times. This boy has not had one attack since his operation six or seven weeks ago. We all know that the results of this operation are not always permanent, but an intermission of a few months or of one year is well worth the operation. Both of these cases were of the form known as Jacksonian epilepsy, the form to which Jackson first called the attention of the medical world. In these cases certain well-defined groups of mus-

cles are first affected, and a spasm extends from there to the general muscular system. In the case of the boy the fingers of the right hand are first affected, then the right hand, then the right arm, then the whole right half of the body, and then the whole body, become involved in a characteristic epileptic paroxysm, which can be easily traced to the right upper extremity as a local focus. You all know that there is a spot in the cortex irritation of which by galvanism produces twitching of the right upper extremity. We sought this centre, and, exposing the dura mater, found a well-defined area of the dura, pear-shaped, markedly hyperæmic. There was thickening of the dura and an intimate adhesion between that membrane and the vitreous lamella of the cranium.

In the second case, the right side of the mouth and face, and the right arm were affected. There never was total loss of consciousness. Nevertheless, the epileptic attack was well defined, and the operation we thought justifiable. We located the centre for the face, and cut down upon it. We found here also a deeply congested dura through an oblong irregularly outlined space.

Upon cutting down in some cases we find a cicatrix of the dura, an old fractured depression of the bone or a cyst of the dura, which when incised and evacuated removes the disease, and the symptoms disappear. These cases were formerly treated by potassium bromide in enormous doses, and that was all. It is worth while for the surgeon to do what can be done for their relief.

To-day I received a patient into the hospital also for traumatic epilepsy, apparently of the Jacksonian type. The statements of patients' friends are, however, so unsatisfactory, so unreliable, that I would not operate in such a case without the opportunity of seeing an attack or of having it observed by competent witnesses. It is said that in this case the convulsions commence in the right half of the face and from there extend to one arm and leg. It is said that the convulsions of the right half of the body are tonic, while those of the left half are clonic. There is loss of consciousness in this case. If we find this history verified, with the knowledge which we have of the blow on the left side of the head, we shall explore over the upper portion of the fissure of Rolando.

NEPHRECTOMY FOR TUBERCULAR KIDNEY.

Another case may interest you. Three weeks ago I removed a tubercular displaced kidney in the case of a woman who presented herself at the hospital some time ago with a diagnosis of enlarged spleen.

She had had chills and fever, and was told at another hospital that she had a fever-cake. The tumor was in the left inguinal region, and the woman was worn to a skeleton. She was admitted to the Mount Sinai Hospital. A needle was inserted into the tumor, with the withdrawal of urinous pus. An incision evacuated a quart of stinking pus. The patient was under the anæsthetic only three minutes, yet she nearly died. In fact, we removed her precipitately to her bed in order that we might say that she had left the operating-table alive. She was revived, however, by the use of stimulating enemata from a condition in which the pupils were widely dilated and the eyeballs flabby,—at the time a practically dead woman. She survived and improved. Her night-sweats disappeared, and she was finally discharged from the hospital to feed up.

Four weeks ago she was readmitted, still a sorry-looking object, but a much more hopeful one than six months before. Yet it was with some misgivings that I proceeded to the operation, knowing that I must invade the peritoneal cavity. I found, however, that the patient responded very well to the ether, her pulse improving as the anæsthesia progressed. I was very careful to avoid hemorrhage, although I made a long incision. This was very important, as without room one might easily tear one of the large vessels of the kidney, and before the vessel could be secured the patient would be dead. My incision extended from within two inches of the spinal column to the umbilicus, transversely around the trunk. I went down through the cicatricial tissue to the tumor, incised the capsule, and shelled out the tumor. The peritoneal cavity was unavoidably opened, as I had feared. I plugged the opening, however, with iodoformized gauze, and irrigated, washing away the pus as the cavities were opened. There was not only the large cavity which we had drained by the earlier operation, but also a number of smaller secondary cavities. I ligated and cut away the tumor, and put a few catgut stitches into the peritoneal wound.

The large cavity has closed, but ten days ago there was a fistula with a small amount of fecal discharge of a pale color and with little of the characteristic odor. Evidently I had bruised the small intestine; but it was not cut, or three weeks would not have elapsed before the appearance of the fecal discharge. This discharge is already diminishing, and I believe that it will finally cease and that the fistula will close.

Microscopic examination established tuberculosis in this case. There was no evidence of disease of the other kidney. Even at the time of

the patient's first admission to the hospital the urine was normal. It was still found normal before the second operation. This was one of the most important considerations in determining my action. The urine was abundant and acid ; there were no pus, no albumin, no casts.

[*Note, February 14, 1893.*—The woman recovered completely, and is now, two years after the operation, hale and hearty, doing all her housework without aid, and has gained over thirty pounds in weight.]

RESECTION OF THE LOWER JAW FOR CARCINOMA; SUPRAPUBIC SECTION FOR VESICAL CALCULUS.

CLINICAL LECTURE DELIVERED AT ST. LUKE'S HOSPITAL.

BY B. FARQUHAR CURTIS, M.D.,

Surgeon to St. Luke's Hospital and to the New York Cancer Hospital.

GENTLEMEN,—CASE I.—Our first patient is a man only thirty years of age. Two years ago he noticed a small lump in the lower lip. This was excised, but within four months there was an enlargement of the glands under the chin. These were also removed, but soon other glands became involved, and he now comes to us with a very large tumor in the neck. He has practically no pain, and he has not lost either flesh or strength. The history shows plainly enough that the growth was originally an epithelioma, and it is evident that he has now a carcinoma involving the cervical glands. Besides the youth of the patient, another interesting point in the case is the fact that there has been no recurrence directly at the point where the original growth was situated, showing that the first operation was a thorough one.

The ordinary incision for the removal of the lower jaw begins in the middle line, and, running along the lower border of the jaw, extends up along the ramus; but the ascending limb of the incision can be omitted if the ramus be healthy, as one can strip up the periosteum from below and twist out the bone. The usual incision up to the zygoma is a very extensive one, and should be avoided, whenever possible, on account of the necessary division of the facial nerve. In this case the growth extends down to the larynx and to the angle of the jaw, but the deeper part of the neck seems to be comparatively free. However, as he is unable to separate the teeth more than about one inch, it is not improbable that the disease extends into the fossa behind the ramus of the jaw. This limitation of the movement of the jaw is a very valuable sign of involvement of the pterygoid fossa by the disease.

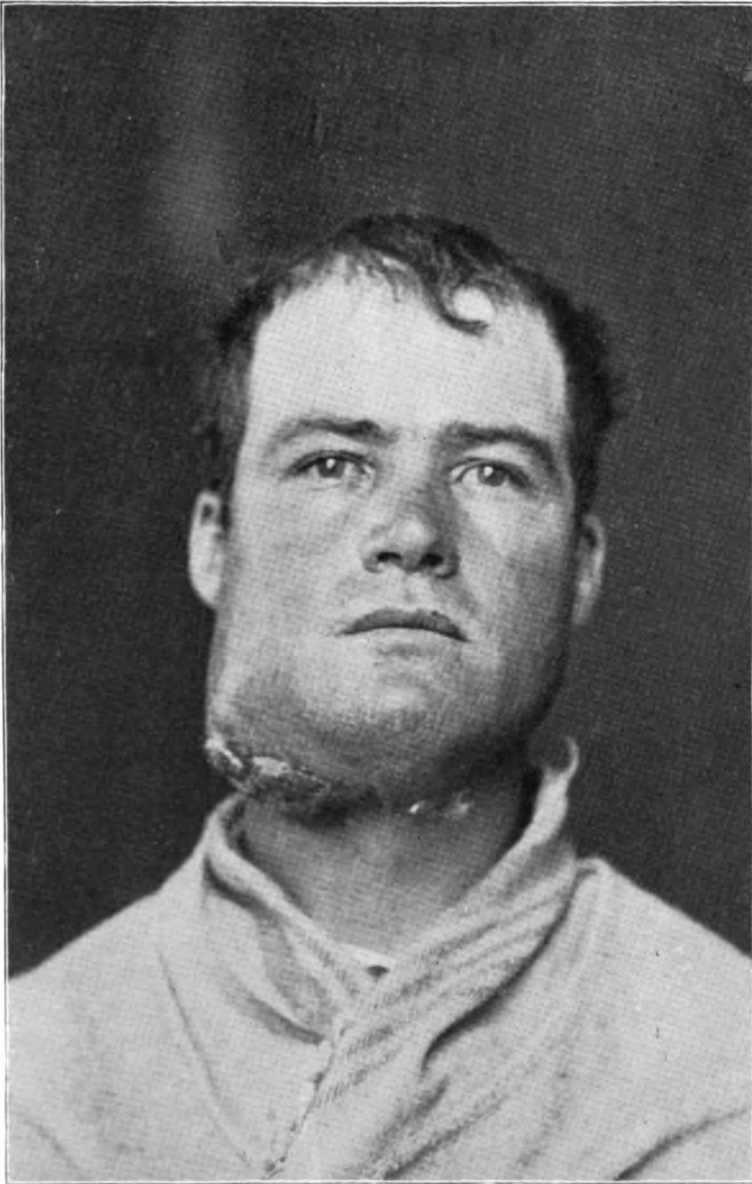
I shall make the skin incision first, and do as much dissection as possible before opening into the mouth. The venous hemorrhage is considerable, owing to the fact that whenever there is any obstruction to the free opening of the mouth the patient usually takes ether badly, and there is apt to be cyanosis. The removal of a portion of the ramus is a much more difficult operation than the removal of the entire bone, but our patient is desirous that as little bone as possible should be removed.

The tumor is found to have very extensive deep attachments, so a portion of the ramus must be removed. After sawing through the ramus with a Hey's saw, a tedious blunt dissection is necessary in order to remove a portion of the bone. During this part of the operation the retractors must be used with great caution, as they are liable to slip and injure the internal maxillary artery or perforate the mucous membrane of the mouth. Opening into the mouth should be avoided as long as possible. We now find that the tumor involves the periosteum on the inner side of the bone beyond the point where the section was made, so that it will be necessary for us to remove this portion also. After further dissection, I have at last succeeded in removing a portion of bone with the tumor, and you see that the growth was very extensively adherent to the deep vessels of the neck and to the hyoid bone, and apparently there is also some infiltration of the tissues as far down as the thyro-hyoid membrane.

We shall endeavor to secure primary union of the mucous membrane in the mouth, and shall pack the external wound temporarily, at least. Before doing so we shall insert this interdental splint, in order to keep the jaw as nearly as possible in its normal position.

The prognosis in this case is very gloomy, for I have never seen a case where the disease involved the pterygoid fossa in which there was not an early recurrence, no matter how carefully the operation may have been performed.

The first set of sutures which I have introduced is of silk, so that they will eventually cut through into the mouth. Over this another row of catgut sutures is inserted, and the wound will then be packed with iodoform gauze. By this means we hope to secure primary union of this portion of the wound, and the rest of the wound can be drawn together by secondary sutures in a few days. When secondary sutures are to be used, it is often wise to put in a few coarse sutures, drawing the lips of the wound together over the packing, as otherwise there is so much retraction of the skin, after packing the wound for a few days, that it is difficult to secure proper apposition of its edges.



Secondary carcinoma of the glands of the neck. The picture shows the healthy scar on the right half of the lower lip, where the original tumor was situated.

CASE II.—Our next patient is a man thirty years of age, who for the past two years has been complaining of frequent and painful micturition, and he describes a sudden stoppage of the urine which would seem to indicate that there is a valvular closure. The examination of the urine shows very little pus, only three per cent. of albumin, and no blood. The physical examination gave the first distinct evidence of the presence of a stone in the bladder.

You are all familiar with the operation of suprapubic cystotomy, which is comparatively simple in ordinary cases. A rubber bag is inserted into the rectum, and distended with eight or nine ounces of air or fluid, and the bladder is then somewhat distended with fluid until it can be felt above the pubes. If the disease be of long standing the bladder may be much contracted, and it must be remembered that it will sometimes hold only about four ounces of urine, and hence, under such circumstances, care must be taken not to overdistend the bladder. I think the position suggested by Trendelenburg is a great help in this operation, because the intestines fall away and the peritoneal fold is drawn up so that the bladder does not require to be distended so much ; but I do not approve of the transverse incision in the muscle which he recommends, on account of the liability to subsequent hernia. I have made no other examination than with the sound, but the calculus is apparently only of moderate size.

The patient being in the Trendelenburg position, and the bag having been inserted in the rectum, I introduce a searcher into the bladder and detect the stone. The rectal bag is inserted and filled with eight ounces of water. A soft catheter is now introduced, the urine evacuated, and the bladder moderately distended with fluid,—it holds eight ounces. The skin incision begins in the middle line, extending upward from the pubes about two and a half inches. Pushing up the peritoneal fat with the peritoneum, the distended veins on the anterior surface of the bladder are plainly visible. I now pass two silk threads through the bladder about half an inch apart, and by using these as retractors the bladder is drawn up into the wound. In making the incision into the bladder I shall endeavor to avoid, as far as possible, injuring the plexus of veins on its surface. Having made an incision into the bladder, about one inch long, I introduce the forceps, and, after some little manipulation, am able to seize and withdraw the stone. You see that it is much larger than we expected, being a smooth and flattened oval, about one and a quarter inches in its longest diameter, and is apparently phosphatic. It seems strange that so large a stone should have given rise to so few symptoms. In a case like this, in

which the bladder is healthy, there is a very excellent chance of securing primary union of the vesical wound, and if we can do this we shall materially shorten the period of treatment. Ordinarily, the bladder-wall being diseased, it is safer to simply pack the wound and drain the bladder. This, of course, results in a fistula, which, although of small size, is very apt to persist for a very long time. I think it probable that the operation of suprapubic cystotomy will ultimately replace lithotripsy or litholapaxy, for it is not so prolonged, and has the very great advantage of enabling the operator to be sure that all fragments of calculi have been removed from the bladder. Litholapaxy will then probably be reserved for special cases, where patients are unwilling to lie in bed for three or four weeks. Litholapaxy is a much more tedious operation, requiring a prolonged anæsthesia, and, consequently, when there is disease of the kidneys a suprapubic cystotomy is safer, although any operation is dangerous under the circumstances.

A great many methods of suturing the bladder have been suggested, but personally I think it makes very little difference which one is selected. The only practical point to bear in mind is the danger of the formation of calculi around the stitches as nuclei, if these be allowed to project into the bladder. For this reason I think it is prudent when two or three tiers of stitches are made, that the first one should take all the coats except the mucous membrane, and the second tier pick up the external surface of the bladder on each side and roll it in on top of the first tier of stitches. One of the more complicated methods is called "the purse-string suture." Here the bladder-wall is split on each side, and one flap rolled in, while the other is rolled outward; the idea being to broaden the raw surfaces which are in contact, very much as is done in the flap-splitting operation for fistula. A suture is then passed circularly around the opening and tied, so as to pucker up the flaps in the centre. It is difficult to employ such complicated methods in a deep wound: and if not done accurately, they are worse than useless. You see I have introduced three stitches about one-fourth of an inch apart; over these I shall roll in the external-layer surface of the bladder by several sutures passed, like Lembert stitches, as a sort of reinforcement. Even if we fail in obtaining primary union of the bladder-wound, the resulting wound will be smaller and the period of convalescence shorter.

Regarding the after-treatment authorities differ. Some employ permanent drainage by means of a catheter in the urethra; others have the patient catheterized at regular intervals; and still others advocate allowing the patient to pass his water himself. In this city,

I think, there is a very decided prejudice against the permanent catheter for drainage on account of the liability to urethral fever, which we know is a form of septic fever. Frequent catheterization prevents over-distention of the bladder and avoids this danger of the permanent catheter, and is much more likely to be successful than where a strain is put upon the sutures, as occurs when the patient is allowed to pass his water. Having closed the bladder-wound, I shall pack the external wound lightly with iodoform gauze, and apply an abundant, light, sterilized dressing, as for a laparotomy.

THE SURGICAL TREATMENT OF GALL-STONES.

CLINICAL LECTURE DELIVERED AT THE MIDDLESEX HOSPITAL.

BY A. PEARCE GOULD, M.S., F.R.C.S.,

Senior Assistant Surgeon, Middlesex Hospital, London.

GENTLEMEN,—The subject to which I wish to call your attention to-day is one that has but recently engaged the attention of surgeons. For some years hydatid tumors and abscesses of the liver have been submitted to surgical treatment, but only recently has surgery been applied to the relief of those distressing conditions which sometimes result from the presence of gall-stones within the gall-bladder or the bile-ducts. It is of these cases I wish to speak to-day, and I propose to relate to you four cases which have been recently under my care, and which illustrate the different conditions for which the aid of surgery is sought, and the chief methods of treatment to be employed. I will first relate the cases and then comment on them briefly.

CASE I.—Large single calculus tightly impacted in cystic duct. Miss B., aged thirty-five, was brought to me on June 23, 1891. She was thin and pale, with hair turning gray. From time to time she had suffered from what she called "bilious attacks," but her chief trouble dated from ten days before she saw me, when she woke at four A.M. with violent pain in the right side of the belly, frequent bilious vomiting, and jaundice. The sickness lasted one day, and the pain and tenderness gradually subsided in three or four days. On examining the abdomen I found a tumor as large as my fist lying behind the right rectus abdominis muscle, extending from the liver above to just below the umbilicus. The tumor had a smooth and rounded surface, was tense and movable from side to side, but not from above down, but it moved a little with respiration. The diagnosis of distention of the gall-bladder from a stone impacted in the cystic duct was made, and on the 30th of June I operated.

Operation.—The patient having been anæsthetized, an incision nearly three inches long was made over the upper end of the right linea

semilunaris and carried down into the peritoneal cavity. This exposed the liver, which was found to be stretched downward over a greatly-enlarged gall-bladder. The whole of the front of the bladder tumor was covered by the liver, and to get access to it the fundus of the gall-bladder had to be tilted up out of the wound. Having protected the peritoneal cavity by flat sponges carefully packed around, I introduced a fine aspirator-needle into the wound and drew off ninety cubic centimetres of bile-stained mucus. I then opened the gall-bladder sufficiently to introduce my forefinger, and with it felt the rounded end of a very large gall-stone which was firmly impacted in the cystic duct. The stone did not project into the bladder sufficiently to admit of its being grasped by any forceps. I then passed one forefinger into the belly and supported the stone in the duct from the outside, while with a fine scoop I carefully worked at it from within the bladder, until in a few moments it slipped into the bladder and was then removed with forceps. Failing to detect any other stone in the bladder or either of the ducts, I stitched the wound in the gall-bladder to the peritoneum and skin of the abdominal incision, closed the parietal wound above and below, placed a large drain in the gall-bladder, and dressed the wound with alembroth dressings. All the steps of the operation were conducted antiseptically. The stone, which I show you, is ovoid in shape, slightly uneven on the surface, measures two by one and one-eighth inches, and weighs, now that it is dry, three-quarters of an ounce. The patient's convalescence was uninterrupted, but a biliary fistula remained for some time. When I saw this patient last (in August, 1892, thirteen and a half months after the operation), her general health was very good, the motions were normal in color, she was entirely free from pain, and during the day the lint over the fistula was only slightly stained with bile; a little more escaped at night. I carefully scraped and cauterized the fine orifice of the sinus and advised a pad to be worn firmly over it. I have not heard of her since, and therefore believe the fistula is long since closed.

CASE II.—Recurrent biliary colic. Mrs. G., forty-two years of age, was under my care in Queen Ward at the latter end of last year.

For the past three years she had suffered from attacks of pain in the belly, coming on suddenly every two, three, four, or six weeks and lasting from two to six days. The pain was of a very severe burning character, starting in the right hypochondrium, passing across the abdomen, and sometimes radiating to the shoulders; it was accompanied with vomiting and great collapse, and sometimes with jaundice. During the attacks very little urine was passed; the pain always ceased

suddenly. She was a well-nourished woman, and, when I saw her, her chief symptom was tenderness over the gall-bladder, which was thought to be enlarged. As these attacks of pain were so severe and so frequent, I decided to explore the gall-bladder and to remove the calculi which were believed to be there.

I operated on December 10, cutting down upon the gall-bladder in the right semilunar line. On opening the abdomen, the gall-bladder was found to be small, entirely hidden away under the liver, and its fundus was covered over by adhesions between the colon and the anterior edge of the liver. These adhesions I cut through, and then I opened the gall-bladder and removed with forceps nine calculi. The gall-bladder was so small that it would have been impracticable to unite the wound in it to the abdominal incision; I therefore closed the wound in it by fine silk sutures passed through the muscular coat only, and to afford additional protection against any leakage between the stitches, I replaced the adhesions I had previously divided and united them carefully to the liver. I closed the abdominal wound, leaving a small drain, in case of accident. As you saw, the convalescence was uninterrupted, the drainage-tube was removed on the fifth day, and the patient left the hospital on January 6. She has come to the hospital to show herself several times since, and is now in the enjoyment of perfect health.

ABSCCESS IN ABDOMINAL WALLS, CONTAINING GALL-STONES.

CASE III.—Mr. J. W. C., aged thirty-eight, a robust, healthy-looking man, consulted me in May, 1887. His illness began two years before during an attack of jaundice, commencing with very severe pain at the epigastrium, followed by collapse. Such attacks had recurred with severity on several occasions.

Five months before I saw him he felt a tightness across the upper part of the abdomen, and found a lump which since then had increased in size, but had not caused any pain.

I found a swelling at the junction of the right hypochondrium and the epigastrium; the skin over it was red; the centre of the swelling was soft and fluctuating and the periphery was firm. There was no jaundice and no enlargement of the liver or spleen, or other visceral disease.

The diagnosis of abscess in the abdominal wall caused by gall-stones was made, and accordingly I operated and evacuated a quantity of thin gray pus and one hundred and forty small calculi, which together weighed twenty-one grains (dry). The wound slowly healed,

and the patient (whom I have seen several times since) has continued in excellent health, without any return of his old trouble.

You will find this case more fully recorded in the twenty-first volume of the Clinical Society Transactions, where I refer to thirty-five similar cases of which I found a record. Such abscesses may "point" a long way from the gall-bladder,—often at the umbilicus, sometimes in the groin. In opening them, great care should be taken to remove all the calculi; if any are left behind a fistulous opening continues to discharge.

GALL-STONE IMPACTED IN THE ILEUM.

CASE IV.—Mrs. S., aged fifty-seven, a fat, unhealthy-looking woman, was admitted to the hospital on September 17, 1890. Four years before she had been in Charing Cross Hospital with jaundice, and a year before she had been under Dr. Coupland's care for what was diagnosed as "gall-stones." Her immediate history was as follows:

On September 14, while in church, she was suddenly taken with severe pain in the belly, griping in character, paroxysmal, and referred to the umbilicus. In the afternoon she was sick, and she continued to bring up everything taken into the stomach.

On Tuesday, the 16th, the vomit became very offensive. Nothing was passed by the bowel after the evening of Saturday, 13th. I saw her on Wednesday, September 18, suffering from regurgitant vomiting, absolute obstruction, and attacks of acute pain referred to the umbilicus, which was the seat of an irreducible hernia. I determined to operate: to explore first the hernia, and, failing to find a cause of obstruction there, to explore the abdomen; the impaction of a gall-stone in the intestine being present to my mind as the source of the trouble, owing to the previous history of the case, to the sudden onset of the symptoms, and the acute pain.

On opening the hernial sac, it was found to contain a mass of adherent omentum, but there was no sign of strangulation. On passing the finger through the neck of the sac into the belly, a hard lump in a coil of small intestine was at once felt. The abdominal incision was prolonged downward and the obstructed loop of bowel was drawn out. A large gall-stone was found to be firmly impacted in it, the bowel above being greatly distended and that below being contracted. The calculus was gently pushed up into a part of the dilated bowel, and removed through an incision two and a half inches long made in the long axis of the bowels opposite the mesentery. This wound was carefully closed with Lembert sutures, the bowel returned, while the

incision in the belly was sutured. The patient sank and died twenty-nine hours after the operation. During this time three loose motions were passed; there was no vomiting. At the autopsy, the coils of intestine were found softly glued together; no pus. The incision, two and a half inches long, was found in the upper part of the ileum; a little suppuration around two sutures, but the stitches were holding firmly. The bowel from a little above the wound in it was greatly distended with fluid and gas.

An oval ulcer measuring one by one-half inch was found in the duodenum, communicating with the gall-bladder; the latter was very small and empty.

The heart was fatty. A small myxomatous tumor was found growing in the right kidney.

The gall-stone is ovoid in shape, slightly tuberculated on the surface, and measures two inches in length and one and a quarter inches across at its widest part.

The history of gall-stones is surrounded with a great deal of mystery. We know very little, if anything, as to the real cause of their formation, what determines their position, their size, or their number. Still more are we in the dark as to the factors which determine the issue of a particular case of gall-stones. We know that in the majority of cases they lie quiescent in the gall-bladder, causing at the most occasional discomfort; their presence being possibly *suspected* during life, but only verified after death. But under certain conditions, of which I fear we know nothing, they cause the most serious and distressing symptoms, and the cases I have related to you illustrate the various courses they may pursue and the manner in which they can be dealt with by surgeons.

1. Of these complications, the passage of a small stone along the cystic and common bile-ducts into the intestine, causing *biliary colic*, is the most frequent. I need say nothing to emphasize the intensity of suffering sometimes caused by this passage, nor need I enlarge on the danger arising from ulceration of the ducts and perforative peritonitis. On the other hand, it is important to remember that such attacks are frequently passed through safely and sometimes are not repeated. It is clear, then, that surgical assistance should be sought only in certain cases of biliary colic. What are they?

(1) When the attacks are frequently repeated, and are of such frequency and of such intensity as to disable the patient from her usual avocations.

(2) Where the attack is long continued, showing that the obstructing calculus is of large size, passing with great difficulty, if at all, and exposing the patient to great danger of perforation.

In either of these conditions the prospect offered by an operation is decidedly better than any held out by medical treatment. Experience shows that by operation the source of pain and danger can be removed never to recur, although in some circumstances the difficulties and also the dangers of the operation are such as to tax the operator's skill to the utmost. You will notice that neither of the conditions calling for this operation is absolute; great discretion, therefore, is needed in determining just what cases should be handed over to the surgeon. I must point out also that the operation is one that should only be attempted under the best conditions, and of these the most important are, experience on the part of the operator, a skilled assistant, a good light, and thorough asepsis. The surgeon must be prepared to deal with complicated adhesions, impaction of a stone at a great depth, the closure of a wound in the duct, the suture or excision of the gall-bladder, and efficient drainage.

Whenever possible the calculi should be removed through an incision into the gall-bladder, which should be subsequently united to the parietal wound. Experience has shown this to be a procedure attended with very small risk to life. Where the gall-bladder is of normal size, or enlarged, this is comparatively easy; but when the stones are lodged in a small, shrunken bladder tucked away under the liver, covered over by adhesions between the colon and liver, and at the bottom of a deep wound, the whole operation is a difficult one, and it cannot be completed by uniting the gall-bladder to the abdominal wall. In these circumstances three courses are open to the surgeon; he may excise the gall-bladder, placing a ligature upon the cystic duct; he may close his incision into the gall-bladder by carefully-placed sutures, strengthened and safeguarded by an omental flap or graft or its equivalent; or he may simply place a large drainage-tube into the gall-bladder to allow of the escape of bile, and trust to the speedy shutting off of the general peritoneal cavity by adhesions. Excision of the gall-bladder is especially indicated where this viscus has been much torn or otherwise injured in removing the stones, and where the peritoneal investment forms a mesentery and allows the bladder to be readily separated from the liver. Where the gall-bladder has not been seriously injured, and a satisfactory suture of it can be made, this is the best course to pursue. There is a third series of cases in which the surgeon must trust to free drainage only, and this has proved successful in many instances. When the

stones are impacted in the cystic or common bile-duct, and cannot be returned into and then removed from the gall-bladder, two methods of treatment are open : the calculi can be fragmented by carefully-padded forceps applied outside the duct, or by a fine needle passed obliquely into the stones. These fragments may then be gently pushed on into the bowel. But the other, and in many cases more satisfactory, plan is to incise the duct and remove the calculi. The incision in the duct must then be carefully sutured, or, where this is impracticable, a large drain must be placed in the abdominal wound, reaching quite down to the incision in the duct. I must further warn you that in all cases of intra-peritoneal suture of the gall-bladder or bile-ducts you should leave a drain in the parietal wound for four or five days at least, as a safeguard in case the closure of the wound in the bladder or duct is imperfect.

It has been suggested in these cases that a glass drain should be placed in Douglas's pouch, through a small suprapubic wound, but I regard this as unnecessary.

To sum up this matter : where possible, suture the incision in the gall-bladder to the abdominal wound ; where this is impossible, make a careful intra-peritoneal suture and drain the peritoneal cavity ; and if this is impracticable, trust to free drainage alone, or in a certain limited group of cases excise the gall-bladder.

2. *The second complication* is impaction of a stone in the cystic duct, with subsequent distention of the gall-bladder with bile-stained mucus. The tumor so formed may attain a great size ; it enlarges downward and towards the umbilicus in a characteristic way ; commonly there is resonance over the lower and inner parts of the front of such a tumor. I have known it to be mistaken for a renal tumor in more than one or two cases. The absence of jaundice must not mislead, for only if the stone reaches into the common duct, or causes inflammatory swelling of its walls, will this symptom be produced.

In such a case the treatment is equally clear and satisfactory. Without delay such cases should be submitted to operation. Delay means peril and a longer period of convalescence.

I need not again go over the steps of the operation ; I will only refer to three special points in it.

(1) The emptying of the gall-bladder by an aspirator before it is freely opened, and with precautions to prevent the contents coming in contact with the peritoneum.

(2) The great care needed to remove the stone without tearing the duct. The wall of the gall-bladder may be of considerable thickness, but the wall of the duct where the stone is may be of extreme tenuity,

and a wound may not only be easily made in it, but readily overlooked when made.

(3) The wisdom of suturing the wound in the gall-bladder to the parietal incision. As a rule, the fistula thus formed closes in six weeks; in the case I have related to you it was open for several months; but the stone was very large, the cystic duct must have been of great size, and therefore the tendency for the bile to pass along it rather than along the common duct must have been very great. No doubt it is tempting to close such a wound in the bladder and return it within the abdomen; that is the ideal operation; but the success that has followed the other plan, its undoubtedly greater safety, forbids me to recommend it. I think it may be found to be a valuable improvement in this operation to suture the gall-bladder to the parietal peritoneum and transversalis fascia rather than to the skin; latterly I have been trying this plan, but my experience of it is not sufficient to warrant my expressing a definite opinion yet. I hope we shall find that this method of suture quickens the closure of the biliary fistula. And that leads me to speak of the treatment of biliary fistula left after an operation upon the gall-bladder. The most important cause of this is the overlooking of a calculus at the time of the operation, and the failure to remove the entire obstruction to the proper channel for the bile. Never fail to make a most careful examination of the cystic and common bile-ducts, both from within and especially from their peritoneal surface. Other causes of permanent obstruction of the ducts are cicatrization of an ulcer produced by the impaction of a gall-stone, and the pressure of a growth in the head of the pancreas. Where the persistent fistula is caused by a stone, its removal is the one and only treatment; when it arises from a permanent closure of the common bile-duct, cholecystenterostomy—the formation of a fistulous communication between the gall-bladder and the adjacent colon—is indicated; where neither of these conditions exists, you will find firm pressure over the orifice of the fistula will greatly hasten its closure.

The other complications are of much rarer occurrence.

3. *The Formation of an External Abscess.*—As to this there is little to be said. The abscess forms very insidiously, with little or no pain and slight signs of inflammation; it may open externally at some distance from the gall-bladder,—often at the umbilicus, sometimes at the groin. The important points in the treatment of such a case are to remove all the calculi, when opening the abscess, and to remember that the external wound is oftentimes but the orifice of a long, sinuous track, and special care therefore is required in the dressing.

4. *Impaction of a Gall-Stone in the Intestine.*—A gall-stone large enough to occlude the bowel rarely reaches it through the common bile-duct, but by a fistulous communication with the intestine. This communication takes place either with the duodenum—as in my case—or with the colon. This explains the fact that very large stones have been passed through the anus without producing very serious symptoms of obstruction, while smaller calculi have caused fatal obstruction of the small bowel. A gall-stone which has passed into the colon may always pass or be removed per anum without any operation. If it ulcerates into the duodenum, it is most likely to lodge in the ileo-cæcal valve—the smallest part of the canal—or the lower part of the ileum. The symptoms of such an accident are very acute, with an abrupt onset: severe pain, frequent vomiting becoming fæcal, complete constipation, and collapse. Many cases have terminated in recovery, the stone fortunately passing on through the valve. But the danger of perforation of the bowel is very great. The treatment would appear to be by opium and belladonna, with starvation for forty-eight hours, and to this may be added careful and gentle massage over the seat of pain. If the symptoms continue, a laparotomy should be done. Having found the stone, the surgeon may either pass it on, crush or crack it, or excise it.

If the stone is caught in the ileo-cæcal valve, gentle pressure is usually sufficient to extrude it into the colon. If in the ileum, it may be fragmented or removed. A moderate squeeze in padded forceps, or the passage into the stone of a fine steel needle, generally suffices to break it into fragments, which can then pass on. But this plan is not devoid of danger, for, as a specimen in our museum shows, this intestine may be reduced to extreme tenuity by the pressure of the stone, and it may be in such a condition that the most careful squeeze with a forceps may rupture it, or the puncture of a needle cause an ulcer. Such manipulation should only be made through fairly healthy bowel-wall, and remembering that bowel distended from obstruction is always congested and in a most unfavorable condition for recovery from any lesion, either contusion or prick. Unless, then, the bowel is found tolerably sound, I should, under such circumstances, prefer to excise the stone and close the wound in the bowel by suture.

In doing this three points must be observed:

(1) Push back the stone into the distended bowel above until you reach a part not obviously affected. To incise the bowel tightly stretched over the stone is to court certain failure.

(2) Make a *long, longitudinal* incision in the bowel, *opposite* the

mesentery. It should be *long*, so that the stone may be removed easily without any bruising of the edges of the incision. It should be *longitudinal*, because in that direction ample room can be obtained, and the wound can be closed without undue narrowing of its lumen.

It should be *opposite the mesentery*, because, as the vessels run circularly round the bowel from and to the mesentery, a wound here is attended with the least hemorrhage and does not imperil the nutrition of the gut.

(3) The bowel must be very carefully sutured. The best plan is to unite it by an interrupted Lembert suture, the threads being passed at one-eighth-inch intervals through serous and muscular coats only, and then a continuous or interrupted suture should be passed between the edges of the groove thus made in the bowel. Fine aseptic silk should be used for these sutures.

In an emergency, the wounded intestine might be sutured to the abdominal incision and the artificial anus subsequently closed.

In bringing these remarks to a close I think I may claim that surgery now offers a means of dealing with a class of cases in which medical methods have too often failed to relieve intense suffering or to ward off death. If that is so, it is our duty to see that the help it can afford is not withheld from the patients who need it, at the time when it has the best chance of success. But let us take care that it is not ruthlessly employed, either when not demanded, or without all known precautions against failure.

ECHINOCOCCUS MULTILOCULARIS OF THE BRAIN.

CLINICAL LECTURE DELIVERED AT THE ST. LOUIS MEDICAL COLLEGE.

BY H. H. MUDD, M.D.,

Professor of Clinical Surgery in the Medical Department of Washington University.

GENTLEMEN,—This case has an extremely interesting history. A girl, aged twelve, unusually well developed, suffered during the summer of 1890 with a persistent headache, which continued for about four weeks. The child had been somewhat fretful and nervous before the development of the headache. In the following October a slight swelling or tumor was observed above the left ear in the temporal region. A tumor soon developed, with a soft spot in its central portion. It could be indented, but was sufficiently resilient to return to its position after relief from pressure. Soon after the swelling appeared a twitching of the hand and arm was observed, with some paralysis of the left facial muscles. The leg also became impaired in its motion, and the patient acquired a one-sided gait. The twitching of the muscles of the leg, arm, and face became persistent. She presented a partial hemiparesis of the left side. She had also left-sided hemianopsia.

When she came to me in March last the prominence above the right ear measured three-fourths of an inch in its vertical diameter and two inches in its transverse diameter. It could be indented, but the bone was at no point deficient. The tumor was not sensitive; the patient's general health was good; the head was turned a little to the right; head and neck twitching and unsteady in motion; arm persistently twitching,—much more marked during any exertion. During these spells the hand was rotated inward, with the palm looking outward and backward, the wrist flexed upon the forearm, and the fingers flexed in the palm. Hearing was not impaired, and the mental faculties seemed to be intact. There was no need for cerebral localization, as the tumor was apparent from the outside. The patient was prepared for an operation; a semilunar flap with its base downward

was lifted from the cranium, the periosteum being removed with the flap. The periosteum was closely adherent over the surface of the tumor. The chisel was used to open the skull, and a semilunar opening made around the upper surface of the base of the tumor. The flap of bone was bent downward, and the opening enlarged by the use of the cutting pliers. The dura mater was incised, and a clear limpid fluid escaped. The dura being opened more freely, the tumor was found to be composed of a number of cysts. It occupied the space just above the temporo-sphenoidal lobes, pushing these downward and backward. The cyst-walls and the liquid contents must have had a volume of about three ounces. In the depth of the space occupied by the tumor a thin membranous sac was observed. It was thought to be another cyst, and it was incised. It proved to be the lateral ventricle. A free flow of serum followed the opening. The cavity occupied by the many cysts was carefully cleansed. Drainage by gauze was secured. The flap of bone was turned back and covered with the skin flap. The dura mater was not closed.

An irregular but persistent fever followed the operation. This fever continued for several weeks. Drainage of clear serum was abundant during the first ten days, and did not cease until the seventeenth day. A pulsating tumor developed at the site of the opening in the skull, which on the thirty-fifth day was exposed by lifting a part of the flap; the exact character of this protuberance was then determined. Finding it to be a cerebral hernia, the flap was freshened and stitched into place; firm pressure was now put upon the hernia. It rapidly subsided, and the patient is now practically well and ready to return home. The fever and hernia rapidly disappeared under pressure.

Microscopic examination of the specimen removed proved that it was an echinococcus cyst, having its origin in the larva of the tape-worm of the dog.

The girl had a pet shepherd dog, to which she was very much attached, but which was killed during the summer of 1889. The time of infection could not, of course, be determined, but it was probably eighteen months prior to the operation, and was no doubt due to the association of the child with the pet shepherd dog. The history of the case extended over a period of about eight months. This case is, I believe, the fourth one of the kind that has been subjected to operative interference, and the only one to make a perfect recovery.

AMPUTATION OF THE UPPER LIMB FOR LYMPHATIC ŒDEMA SECONDARY TO CANCER OF THE BREAST.

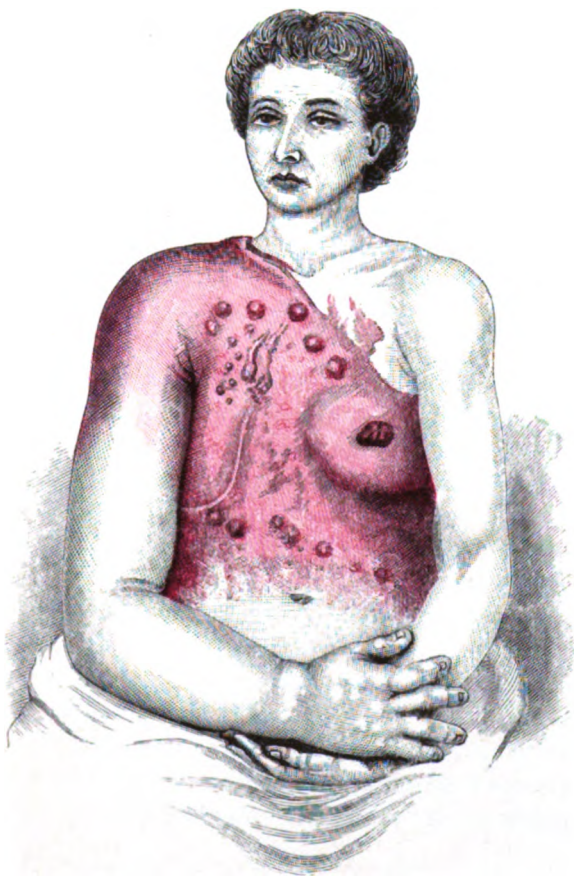
CLINICAL LECTURE DELIVERED AT THE MIDDLESEX HOSPITAL, LONDON.

BY J. BLAND SUTTON, M.D., F.R.C.S.,

Assistant Surgeon to the Middlesex Hospital; Lecturer on Comparative Anatomy and Zoology in the Middlesex Hospital Medical School, etc.

IN some women, after amputation of the breast there supervenes a curious change in the upper limb to which the term lymphatic œdema is applied. Although the condition cannot in any sense be regarded as common, nevertheless, with the unusual facilities which this hospital affords for studying cancer, you get a fair number of opportunities for becoming acquainted with its clinical features. The œdema usually becomes manifest in the skin about the shoulders, and gradually extends to the skin of the arm, and in due course involves the forearm, hand, and fingers. The limb has a swollen appearance, as though the seat of anasarca, but when the surface is pressed with the finger-tip, instead of pitting, it will be found firm, brawny, and unyielding. The limb becomes extremely heavy, and the patient finds it necessary to support it with a sling; exceptionally its weight prevents the patient from walking, and sometimes produces a moderate degree of lateral curvature of the spine. In extreme cases the subcutaneous tissue is so infiltrated with lymph that the skin becomes so tense as to prevent movement at the wrist, elbow, and shoulder: under such conditions the arm resembles a cast rather than a living limb.

When the tissues of such a limb are examined immediately after death, it will be noticed that the increase in size is due to infiltration of the subcutaneous tissue with lymph, which causes the cut surface to resemble in color and in texture the pulp of a succulent orange, and large quantities of lymph flow from the incisions. The muscles are smaller than natural, and infiltrated with fat. This condition is known as lymphatic œdema; and in the character of the fluid exuded from the



Cuirass cancer and lymphatic œdema of the upper limb, following amputation of the right breast.

limb, as well as in the firmness of the infiltrated tissue, it resembles the œdema characteristic of myxœdema.

In the condition we are considering, the obstruction to the lymphatic circulation in the upper limb is due to the pressure of lymphatic glands infiltrated with cancer, or to secondary nodules of the disease lying in the course of the main lymphatic channels at the apex of the axilla. Exceptionally, it complicates the rare form of cancerous dissemination known as "cuirass cancer."

Lymphatic œdema of the upper limb may supervene in patients with cancerous breasts who have never been operated upon: it is liable to occur in cases where the axillary lymphatic glands have been removed with the breast, as well as in those whose axillæ have not been opened. In most of the cases which have come under my notice the right arm was affected. Pain is experienced in the limb by most patients, and it is often very severe. The pain is due not to œdema, but to the enlarged glands or cancerous nodules pressing on the cords of the brachial plexus or its branches.

Until recently patients with arms in the condition of lymphatic œdema were obliged to bear the pain and discomfort produced by these enormous limbs; but it is possible for surgery to relieve them, and two cases will now be described in which relief was afforded by amputation.

CASE I.—In 1892 a school-mistress, aged forty-seven years, was admitted into the cancer ward of the hospital under the care of Mr. Henry Morris. Her right breast had been removed at St. Bartholomew's Hospital in 1889. Secondary nodules began to appear in the skin of the chest six months after the operation. On her admission she presented in a typical manner that form of cancerous dissemination known as cuirass cancer. (Fig. 1.) The right limb was in the condition of lymphatic œdema. The limb, besides being useless, was the source of much pain; its weight had produced a moderate degree of lateral curvature and prevented the patient from taking walking exercise.

As the woman was hampered with such a useless limb, and the disease, though progressive, was advancing so slowly as to make it clear that under favorable conditions her life might long be spared, Mr. Morris cautiously suggested to the patient the propriety of having it amputated, in order that she should be put into a comfortable condition. As the procedure was a departure from the usual practice in such cases, the proposal was put carefully to the patient, and she decided to accept it. At this time I took charge of the beds for the usual autumn recess, and Mr. Morris asked me if I had any scruples in

carrying out this operation. I had no hesitation in carrying out his wishes, and gave him the reasons for my acquiescence, which will be fully set forth in connection with the next case. The arm was so fixed that it could not be moved from the side, and its tissues were so dense that I would not trust to a tourniquet. After cutting an anterior and posterior skin-flap which was four centimetres thick and very succulent, I compressed the artery by gripping the denuded muscles with the fingers of my left hand, and completed the removal of the limb by dividing the muscles circularly and sawing through the bone with the right hand. The point at which the humerus was divided corresponded to the junction of its upper and middle thirds. The arteries were ligated and the flaps lightly brought together so as to allow the lymph to drain freely. Portions of the skin-flaps sloughed, but the wound quickly healed by granulations.

To the patient the result has been most gratifying. She has lost the pain and the sensation of always carrying a heavy weight. She is able to resume her walking exercise, appears quite comfortable, and is persistent in expressing her satisfaction at the result of the operation. The lateral curvature, of course, remains.

CASE II.—Mrs. P., sixty-four years of age, had her right breast removed for cancer by Mr. Henry Morris in 1888. At the same time enlarged glands were removed from the axilla. When I saw her in September, 1892, four years and a half after the removal of the breast, she had a recurrence in the right axilla, a secondary knot on the chest below the right clavicle, and the right upper limb was enormously enlarged in consequence of lymphatic œdema. She complained of intense pain in the axilla, and of the great inconvenience she suffered from the mere weight of the œdematous limb. The particulars of the case were communicated to Mr. Morris, and he recommended me to carry out the same line of treatment as in Case I. My reasons for so willingly carrying out Mr. Morris's proposals were due to the fact that, some months previously, I had been present at an operation in which Mr. Treves had removed the right upper limb, including the scapula, for lymphatic œdema complicating recurrent mammary cancer; the subsequent history of the case was so gratifying that when Mr. Morris asked me to amputate in Case I. I had no hesitation in complying with his wishes, and gave my reasons. Mr. Morris until that time had never heard that such a line of practice had been adopted by any other surgeon, but was led to recommend it seriously to the patient as correct surgery, in view of the distress such a useless limb occasioned. In Mrs. P. I removed the limb and scapula in the following way:

The outer third of the clavicle was exposed and divided on the inner side of the coraco-clavicular ligaments. A skin-flap was fashioned out of the anterior folds of the axilla, the pectoral muscles were divided, and the axillary artery was sought for, clamped, and divided. The posterior skin-flap was cut, and the scapula, with the limb, detached. The vessels were secured with gut and the flaps adjusted with sutures. No attempt was made to remove the recurrent mass in the axilla. The amount of lymph which drained from the flaps was very great. The flaps soon settled, and, except in the neighborhood of the cancer, primary union followed. There were some superficial portions of the cancer which sloughed and left a small discharging sinus. The patient left the hospital in twenty-one days in a very comfortable condition, greatly relieved by the operation and free from pain.

It is a noteworthy fact in these cases that it was many days before the patients were able to realize that the arm had been removed: in each instance the sense of weight was very persistent. The painful sensations disappeared with the removal of the limb.

In Case I. it was impossible to remove the scapula: the skin covering it was like leather. In Case II. preliminary ligation of the subclavian was out of the question, as the course of the artery was obscured by the recurrent tumors.

The most striking fact which is developed by a comparison of the history of the two cases is the rapidity with which the wound healed in Case II., although a considerable mass of cancerous material remained in the axilla. The results, so far as the patient's comfort was concerned, which followed the operation were so very satisfactory that I shall have no hesitation in recommending it in similar cases in the future. Strange as it may seem, amputation of the arm and scapula is accompanied with less shock, and is followed by more rapid healing, than amputation through the shoulder-joint; and as a scapula without the limb is of no service, there need be no hesitation in removing it, not only when the amputation is performed for lymphatic Œdema, but in most cases where it is deemed necessary to amputate the upper limb.

FLATFOOT: ITS PATHOLOGY, CAUSATION, AND TREATMENT.

BY J. SCOTT RIDDELL, C.M., M.B., M.A.,

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FLATFOOT (pes or talipes valgus, or pes planus, so called in the first place from the eversion of the foot, and in the second from the flattening of the sole) is the name given to a condition where the main part of the arch of the foot is lowered, causing thereby a marked deformity, with attendant pain and discomfort from the pressure so brought to bear upon the structures underlying the arch. Briefly put, it may be said, in the words of Professor Humphry, to consist of a "persistent, over-extended, and incurved condition of the astragalo-scaphoid,—the middle and chief joint of the tarsus." (See Fig. 1.)

FIG. 1.



Talipes valgus.

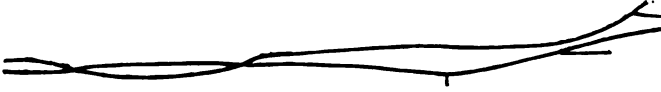
As a further change, the head of the astragalus falls downward and inward and presses that part of the foot anterior to the astragalo-scaphoid joint outward, and so the valgus position is produced.

The deformity in well-marked cases is easily recognized by the obliteration of the arch of the instep and by the undue prominence on the inside of the foot. The latter

is very evident on comparing the deformed with the sound foot, and may be shown by an outline (Fig. 2) from two casts in the Surgical Museum of Aberdeen University, one taken from a sound foot, the other from a flat foot. The sign by which the deformity is most easily

recognized, however, is the obliteration of the arch of the instep and the generally flattened appearance of the sole of the foot. At an early stage the arch, when the foot is at rest, assumes its natural condition,

FIG. 2.



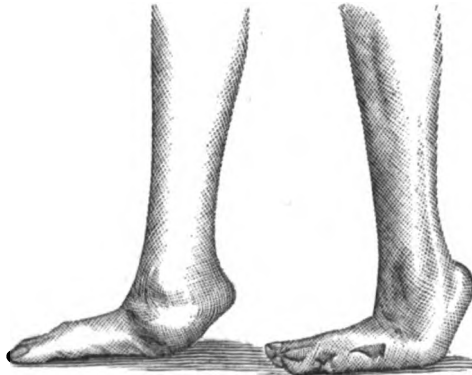
and only when the calcaneo-astragaloid joint is extended by the patient standing or walking does the deformity fully show itself. This is of importance to remember in the diagnosis of an early case of flat-foot (Fig. 3). The outlines below, taken from casts of the same foot

FIG. 3.



at rest and when in use, demonstrate the yielding of the arch which takes place on pressure being brought to bear upon the astragalo-scapoid joint. In extreme cases, where the cause has been at work for some considerable period, still further changes take place in the astragalo-scapoid joint, the head of the astragalus and the articular surface of the scaphoid becoming so altered in shape as to prevent their being brought accurately into apposition by pressure, and the deformity becomes, therefore, irreducible. The annexed cuts of a dissected flatfoot (Figs. 4 and 5), taken, by Professor Ogston's kind permission, from a specimen in

FIG. 4.



the Surgical Museum of Aberdeen University, are intended to show the condition of the astragalo-scapoid joint in an advanced case of flatfoot. In this specimen the articular surface of the astragalus is so increased in size and its head so turned downward, forward, and inward, that two-thirds of its articular surface is exposed and presses against the

stretched calcaneo-scapoid ligament and tibialis posticus tendon, while the other third is in apposition with the altered articular surface of the

FIG. 5.

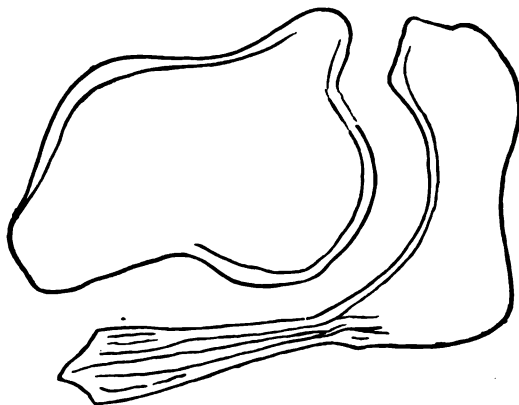


scaphoid. It would have been impossible in life to reduce the deformity, owing to the altered shape of the articular surface of the astragalus. The diagram given below (Fig. 6) is one reproduced from Professor Humphry's paper on a dissected flatfoot, and shows an even greater change in the articular surface, the ridge formed in this advanced case absolutely preventing the reduction of the deformity.

It is a matter of general agreement that flatfoot is found more commonly in females than

in males, that the age at which it is most common is a little after puberty, and that the affection almost universally manifests itself in a class exposed to heavy bodily toil, and particularly in those who have

FIG. 6



to stand continuously at work or to carry heavy weights. The following particulars, which I have collected from notes of seventy-eight cases of flatfoot treated in the Aberdeen Royal Infirmary, may be given in evidence. Of these seventy-eight cases, forty-six occurred in

women and thirty-two in men. The average age of the seventy-eight patients was eighteen years, while in the case of men the average was lower (seventeen and one-half years), in females slightly higher (eighteen and one-third years). The condition thus occurs at an age which has been proved statistically, by a large number of observations as to weight and growth, to be one of decreased nutritive activity in both sexes, but more markedly so in females. It is interesting and instructive to note the occupation of these seventy-eight patients. Of the forty-six females, no fewer than twenty-five were domestic servants, eight were milliners, five were at school, two were dress-makers, and the rest were at home. Of the thirty-two males, there were twelve farm-servants, four laborers, one railway clerk, one baker, one painter, one butcher, and three at school. Of the occupation of the others no record has been kept. About sixty per cent. of these cases came from country districts.

The cause of flatfoot has been much discussed, and many different views have been promulgated. The earliest theory advanced was that of Barwell and Sayre, who attributed it to a paralytic condition of certain muscles connected with the ankle and foot, and more especially the *tibialis anticus*. Billroth, though originally holding the idea that the condition was due to relaxation of the ligaments, finally adopted the views of Lorinser, who attributed it to weakness of the muscles and of the bones, and thought that a rachitic tendency had to do with it.

By Professor Humphry it has been attributed to a wearying of the muscles, and more especially of the *tibialis posticus*, and a stretching of special ligaments. In explaining his theory of the production of flatfoot, Professor Humphry has at some length described the arch of the foot and the part played by each structure in the gradual development of the deformity. In support of his views the following points have been advanced. Looking first at the instep of the foot as an arch, it exhibits an excellent arrangement for securing strength and elasticity, but at the expense of the mutual support of its component parts, for the *astragalus* (which has been described as the key-stone of the arch), while it is supported by the *scaphoid*, does not in turn support the *os calcis*, but rests on it. This want of support is made up for by a subsidiary transverse arch, extending across from the *astragalo-scaphoid* joint through the *cuboid* bone to the bases of the outer two *metatarsals*, and additional support is given by the strong *calcaneo-scaphoid* and *calcaneo-cuboid* ligaments, aided by the *plantar fascia*. Looking next at the mechanical production of flatfoot in rela-

tion to this description of the arch, one can easily understand how, in extension of the foot in walking and in standing, pressure is brought to bear on the calcaneo-scapoid ligament, which in turn is braced up by the sole muscles and by the tibialis posticus; and how, after excessive exertion or in a weakened condition of the parts, the calcaneo-scapoid ligament may tend to yield, the head of the astragalus to fall downward, forward, and inward, and the initial stage of a flatfoot to be reached. This theory does not, however, adequately account for the malformation of the bones found in advanced cases.

Mayo Collier attributes the causation of flatfoot in great measure to the practice of walking with high-heeled boots,—an unnatural condition, as he says, tending to cause the astragalus in the raised position of the heel to slip off the os calcis. He therefore advocates the use of shoes without heels, in which the sole is much thickened anteriorly and thinned posteriorly. This heelless shoe ("carpet shoe") is the one almost universally worn during work by the domestic servant in this part of the country, and it is therefore worth noting in relation to this theory that over fifty-five per cent. of the cases which I have notes of occurred in domestic servants.

It is rather to the age and general condition of the patient that we must look for an explanation. The most recent and most generally accepted view—hinted at previously by Billroth—is that originally published by Professor Ogston. Dr. Ogston believes that flatfoot is really a rickety condition, being due to rachitis adolescentium or "adult rickets," a condition which supervenes in certain cases on or about the age of puberty. This condition of rachitis adolescentium has been well described by Mr. Clement Lucas, who, however, has found albuminuria to coexist with it, and thinks there is some connection between the two. In all the cases of flatfoot I have had under observation there has certainly not been present the albuminuria which Mr. Lucas describes, but there has frequently been observable a softened condition of the bones, as might naturally be expected in a rachitic patient, and, indeed, this was so marked in one case operated on as almost to give the appearance of osteoporosis. This theory is also the one which most adequately accounts for the deforming growth of the head of the astragalus and the alterations in the astragalo-scapoid joint which take place in severe cases.

In passing next to the treatment of flatfoot, the many methods which have been advised may be detailed most clearly by dividing the cases to be treated into three great classes:

1. Those cases which are seen early, and in which the deformity is not great.

2. Those cases in which the deformity is well marked, but in which it is still possible by pressure to replace the head of the astragalus in its proper relative position to the articular surface of the scaphoid.

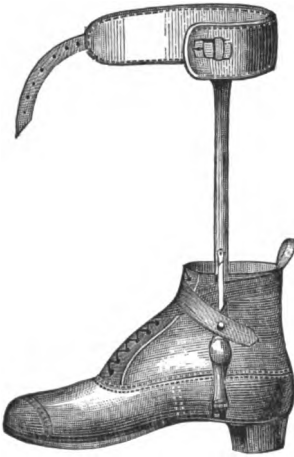
3. Advanced cases in which the deformity cannot be fully reduced, the change in the bones and in the relations of the structures composing the astragalo-scaphoid joint being such as to preclude treatment by any means short of osteotomy.

1. Considering first, then, those cases which are seen early, and in which there is not much displacement, the first and natural treatment which occurs to one to use for the weak and strained condition of the joint is *rest*. This may be carried out in a variety of ways, but most successfully, perhaps, by means of a plaster-of-Paris bandage, applied from the toes to a short distance above the ankle, and left in position from four to six weeks. In an early case this, along with general supporting treatment, may be sufficient to effect a cure. Patients who cannot afford the time necessary for this method may be treated ambulant by applying a Martin's india-rubber bandage securely round the foot and ankle, great relief often following on the use of this elastic support. Some, however, and notably Ellis, have taken exception to the principle of rest as applied to the treatment of this condition, and advocate exercise as the best and speediest means of cure. Mr. Ellis advises that as much vigorous and well-directed exercise as can be properly borne should be taken, that the patient when sitting, or, better, when lying, should be directed to forcibly invert the foot and flex the toes as fully and as often as can be done, and that as soon as possible he should be allowed to spring up on tiptoe, remaining in this position for some time, and then gradually sinking on the heel. He records several cases of complete cure attained by the "exercise" method, and notably his own case (one of six years' standing), which, however, was one of traumatic and not of ordinary acquired flatfoot.

2. Looking, secondly, at the treatment of a more severe set of cases in which there is well-marked but still reducible deformity, a variety of proposals meet us. A common method of treatment is to have the instep of the shoe strengthened and the sole raised on the inside below the astragalo-scaphoid joint, so as to support the arch. This may still better be done by a leather-covered metal sole inserted in the boot, or in other cases by a horse-hair pad fixed to the sole below the instep. The objection to all these methods of support is that the pressure induced on the head of the astragalus and on the sensitive structures below it in keeping up the arch is so great as to cause often greater pain than the deformity itself. To orthopædic apparatus one naturally

looks for help in the treatment of pes valgus. Many different forms have been described, but the following are the most important. The earliest was one invented by Barwell and approved by Sayre, in which support was obtained by adhesive plaster bands fixed to the leg and foot and attached to a splint made of tin. Later on, the valgus boot was invented by Davy, and consisted of a boot with a hinge at the sole plate and an ankle-band. The principle is easily seen from the diagram (Fig. 7). Walsham invented a special boot for flatfoot which gives a fair idea of the general mechanism of these orthopædic appa-

FIG. 7.



Davy's valgus boot.

FIG. 8.



Walsham's flatfoot boot.

ratus. The description of it¹ is as follows: "The boot represented in the accompanying wood-cut (Fig. 8) is one which I have found of much service in the treatment of certain forms of flatfoot in the orthopædic department of St. Bartholomew's Hospital. It differs from the boot with outside leg-iron in ordinary use, inasmuch as in place of the T shape I have substituted a broad band of solid rubber, so that continuous elastic tension is exercised on the sunken arch. The rubber band is firmly secured to the uppers inside the boot along the outer border of the sole in such a position that as it crosses under the sole of the foot its centre corresponds to the middle of the calcaneoscapoid ligament. It is then carried up on the inner side of the foot

¹ Lancet, January 26, 1884.

to just above the top of the boot, and thence through the medium of a strap and buckle secured to the calf-piece. A soft valgus pad is slid over the rubber strap and so adjusted as to correspond, when in position, to the situation of the yielding arch. In place, therefore, of a passive valgus pad to support the arch, active traction through the medium of the pad is exercised on the depressed bones by the rubber strap. In the form in which the deformity is well marked but is unaccompanied by rigidity, I have obtained the best results by the boot above described."

Green invented a much more complicated apparatus on the same principle, but the elastic support was fixed higher,—above the crest of the ilium, instead of on the calf of the leg. It was too complicated and cumbersome an apparatus to be of use save in an orthopædic hospital.

Lately it has occurred to me that in this class of cases, if the arch of the foot, being replaced in position, could by a simple operation be so firmly fixed as to preclude movement and be thereafter maintained in position by stiff bandages, the structures in connection with the astragalo-scapoid joint might so contract and accommodate themselves one to another as to leave, after the expiration of six weeks' to two months' rest, a perfect joint. Accordingly, in the last four cases I have had under treatment the following operation has been performed. The foot, having been carefully disinfected, is palpated, and with the thumb-nail a mark is made over the prominence of the scaphoid on the inside of the foot and on the base of the fifth metatarsal bone on the outside. A half-inch incision is then made horizontally over the scaphoid protuberance down to the bone. The flatfoot deformity is then rectified, and through the middle of the scaphoid transversely across the foot an Archimedian drill is passed. If, in drilling, the mark on the fifth metatarsal previously made is taken as a guide, the drill will pass directly through the cuboid down to the fifth metatarsal joint. Through the opening made by the drill is driven a disinfected ivory peg, which is then cut off short with a wire pliers. The astragalo-scapoid joint has then, as a rule, no tendency to assume its deformed position. If, however, the astragalus's head still inclines to slip downward, a second peg should be inserted just behind the articular surface of the astragalus transversely across the foot through the os calcis at an angle of forty-five degrees to the horizon, and aiming at a point a thumb's-breadth behind the base of the fifth metatarsal bone. The wound is then washed, stitched up, a small antiseptic dressing applied, and the foot incased in a plaster-of-Paris bandage, which is kept on for two

months. The annexed cut (Fig. 9) shows the arches of a case of double flatfoot two months after treatment by this operation. The operation has the advantage of simplicity, but whether it will turn out a reliable one I have not yet sufficient experience of it to say.

3. In the class of advanced cases in which the deformity cannot be reduced, owing to changes in the articular surfaces of the bones, it is plain that operative measures are absolutely necessary, and that these must be of a comparatively severe type. Langenbeck and Willett were

FIG. 9.



A case of double flatfoot two months after operation.

the first to advise that in advanced cases, where there was rigidity, the foot should, under chloroform, be forcibly wrenched into position and then placed in a plaster-of-Paris case in a position of extreme inversion, with the bones forming the arch forced well into place. This proposal involves the exhibition of a force so great as seriously to damage important structures, and the maintenance of the arch is left entirely to the support of a plaster-of-Paris covering, which in such a case is quite inadequate to the duty required of it. Davy has advised excision of the scaphoid, and has recorded cases of benefit from this operation. Professor Stokes removes a wedge-shaped piece of the enlarged

head of the astragalus, such wedge having its base below and its apex above, which when removed allows the depressed portion of the tarsus to be elevated and the arch restored; the after-treatment consists—the wound having healed—in fixing the foot in position by a Dupuytren's splint applied as for Pott's fracture. By far the best operation is one first described and since extensively and successfully practised by Professor Ogston, which aims at ankylosing the astragalo-scapoid joint in the rectified position. This operation is performed by cutting down upon the astragalo-scapoid joint by an incision which begins just in front of the tip of the internal malleolus and passes downward and forward over the middle of the astragalo scaphoid joint. The edges of the wound are then retracted by slender retractors, for which purpose two aneurism needles answer admirably (Figs. 10 and 11).

The articular surface of the astragalus is first attacked by a chisel and its articular cartilage shaved off, any undue prominence of the lower part of the head also being removed. The articular cartilage of the scaphoid is similarly treated, and the two vivified surfaces are then brought in contact and maintained there by two ivory pegs, driven in through two small holes drilled for them antero-posteriorly. After the parts have been well cleansed, the wound stitched, and Lister's or

FIG. 10.

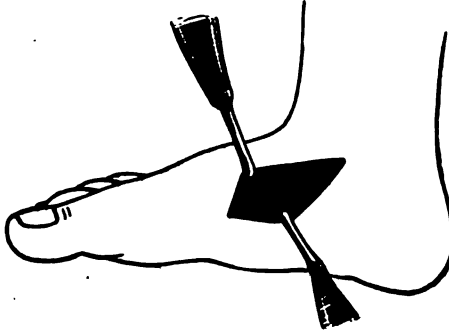
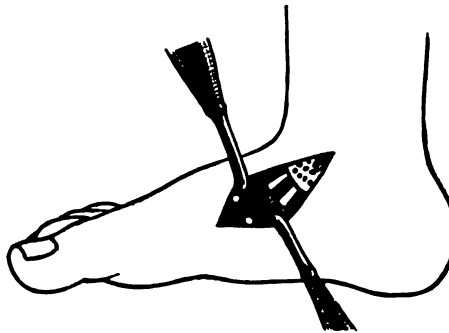


FIG. 11.



Professor Ogston's operation for ankylosing the astragalo-scapoid joint.

other antiseptic dressing applied, the foot is incased in plaster-of-Paris bandages, which are left *in situ* for six weeks to two months, being replaced, if necessary, after that time by another stiff bandage, as it is not infrequent for the joint to require three months' rest before thorough consolidation takes place. I have had the privilege of seeing a considerable number of cases treated in this manner, and the results in most cases have been excellent.

Fig. 12 shows the arches of an advanced case of double flatfoot treated by this method. A fortnight ago I saw a case operated on thirteen years before, in which the result has been perfect.

In advanced cases of flatfoot, Professor Ogston's operation is a most reliable and successful one. I am aware that some have described the operation as an unduly severe one, but in looking over the notes of

FIG. 12.



An advanced case of double flatfoot.

over sixty cases treated in this manner I have been unable to find any history of a bad result following this operation.

From what has been said it will be evident that many views have been advanced as to the causation of talipes valgus, and that a variety of different treatments have been in vogue. The question of the justifiability of operating on these cases has also been much discussed. If I may be allowed to summarize what has been written, I would say that it may be taken as pretty certain that flatfoot is really due to that form of rickets which attacks adults at puberty (*rachitis adolescentium*); that it occurs at an age of lessened nutritive activity, and principally in those exposed to the strain of heavy bodily toil; that the condition is gradually progres-

sive, and, if not treated successfully at an early period by rest, support, or orthopædic apparatus, will end in marked changes being produced at the astragalo-scapoid joint in the bones, and particularly in the head of the astragalus,—changes so great as to preclude successful treatment by any other than operative measures.

Genito-Urinary and Venereal Diseases.

NEPHRITIC ABSCESS CAUSED BY CALCULI.

CLINICAL LECTURE DELIVERED AT THE MEDICO-CHIRURGICAL HOSPITAL.

BY WILLIAM EASTERLY ASHTON, M.D.,

Professor of Gynæcology in the Medico-Chirurgical College of Philadelphia.

GENTLEMEN,—The patient I bring before you this morning is suffering from a renal abscess. She presents the following history. Mrs. G., aged thirty. She has been married for eight years, and is the mother of four children. About four years ago, when five months pregnant with her third child, she noticed an enlargement in the right lumbar region, just above the crest of the ilium. This tumor gave rise to no inconvenience except when pressed upon during foetal movements. At the same time the mass was noticed the urine became loaded with pus. The patient was safely delivered at full term. From this time on until the fourth pregnancy, a period of one year and a half, she suffered no pain and was able to attend to her household duties. Pus, however, was constantly present in the urine. When she became pregnant again, in January, 1891, the pain, however, returned in the right lumbar region. This symptom gradually increased in severity as the gestation advanced. The tumor continued to enlarge, and finally encroached upon the liver, evidently pressing upon the common duct, as the patient was deeply jaundiced in August. Her pain was so severe during the last four months of pregnancy that she was forced to remain in bed most of the time. After her confinement, which took place in September, the tumor occupied a lower position in the abdominal cavity. It was, however, much larger than after her third confinement, and although painful upon pressure, she could walk about with comparative comfort. In February, 1892, the tumor began to grow rapidly, causing her constant pain and distress; the appetite

and strength gradually failed, and the pus disappeared from the urine. In March a nephrotomy was performed and one pint of pus and four calculi were removed from the kidney. This operation was followed by a lessening of the pain and an increase in strength but not in weight; the urine became less cloudy. The drainage-tube was left in position until August, and the sinus remained open until the 7th of December. She began almost immediately to suffer great pain and tenderness upon pressure over the region of the kidney. The tumor increased in size until the 19th of the month, when the sinus reopened and discharged pus freely. Her general condition improved at once, and the pain was relieved.

Ignoring, for the moment, the fact that the surgical history of this patient points clearly to the nature of her disease, let us briefly consider the methods employed in determining the diagnosis of abdominal enlargements. The groundwork in the diagnosis of these cases embraces a clear and definite knowledge of the situation and relative position of the various organs, as well as a careful study of the diseased conditions to which they are liable. As you are aware, the surface of the abdomen is divided into nine arbitrary divisions or spaces for the purpose of limitation in studying the position of the underlying viscera.

These divisions are made by means of two transverse and two vertical lines. The latter, one on each side of the abdomen, extend from the cartilage of the eighth rib to the middle of Poupart's ligament. The upper transverse line encircles the abdomen on a level with the cartilages of the ninth ribs, while the lower touches the highest point of the crest of the ilium on each side. The spaces thus formed, naming them from above, are the right hypochondriac, epigastric, left hypochondriac, right lumbar, umbilical, left lumbar, right inguinal, hypogastric, and left inguinal.

As the tumor before us occupies the right lumbar region, I will not take up your time by referring to the contents of all the divisions just mentioned, but will limit my remarks to the location of the organs in the right lateral spaces of the abdomen. In the hypochondriac region we find located the gall-bladder, the right lobe of the liver, the upper portion of the hepatic flexure of the colon, the superior part of the kidney, and the supra-renal capsule. In the lumbar region are situated the ascending colon and the largest part of its hepatic flexure, the kidney and its ureter, and a few coils of the ileum, while the inguinal space is occupied by the colon, the appendix vermiformis, a portion of the ureter, and the retro-peritoneal glands.

Having now pointed out to you the organs situated in that part of the abdomen occupied by the tumor before us, the next step is to determine from which of the three lateral spaces the growth has developed. To decide this question we examine the abdomen by inspection, palpation, and percussion.

Those of you who are near will notice that the abdomen is non-symmetrical, or, in other words, there is a prominence or distention upon the right side. Again, this enlargement is most distinct above the lower transverse line, and occupies chiefly the right lumbar region, at the same time extending somewhat into the umbilical space. Placing my hands upon the tumor, I find that its lower border is on a level with the iliac crest, while its upper boundary reaches to the liver. Posteriorly the costo-iliac space is completely occupied, while anteriorly the mass extends into the umbilical region. As I examine the growth by percussion, you will notice that the area of dulness corresponds to the limits of the tumor as determined by palpation. In a large tumor of the kidney we are able, at times, to demonstrate by percussion and palpation the presence of the colon passing over its surface. The absence, however, of this important point in the differential diagnosis does not by any means exclude the kidney, as the colon may be completely empty at the time of the examination. We are now in a position, from what has been elicited by the examination, to conclude that this tumor has developed from the right lumbar region. The diagnosis, therefore, by this process of exclusion, practically narrows itself down to a study of the lesions affecting the organs occupying this region of the abdominal cavity. Let me, however, give you one word of caution. Do not be too eager in these cases to jump to conclusions, as one of the viscera may be displaced and occupy an abnormal position, or again, a tumor may grow to a point far distant from where it originally developed. For example, Dr. Charles H. Thomas, of this city, reported several years ago three cases of downward displacement of the transverse colon. In one of these patients the lowest part of the gut was found in the pelvic cavity. Dr. Morton, also of this city, reported a case in which he operated for a supposed appendicitis and found a distended gall-bladder. You must also remember that tumors of the omentum, the abdominal wall, and the parietal peritoneum may occupy the right lumbar region and render the diagnosis still more difficult. It is therefore not sufficient simply to know the situation of a growth, but we must go a step further and determine the point from which it is developed. Now, in the case before us the examination demonstrates not only the situation, but also the starting-point. This

we have proved by outlining its boundaries. Again, the fact that the costo-iliac space is completely filled by this tumor strongly points to the kidney as the organ involved. Referring to the history of our patient, you will remember that the tumor first made its appearance in the right lumbar region, and that at no time did it occupy any other position. This confirms, also, the result of the physical examination. Having now determined that this growth had its origin in the right lumbar region, the question before us is, From what organ is it developed, and what is its nature? The tumor was first noticed by the patient about four years ago. This fact practically excludes malignant disease. Therefore we can set aside the omentum or peritoneum as being the organs affected. Again, cancerous degeneration of these structures is associated with more or less free fluid in the peritoneal cavity. No signs of ascites are present in this case. The physical examination shows that the enlargement is not situated in the abdominal wall. Furthermore, as the patient has had no symptoms of bowel obstruction, we may also eliminate any malignant or benign disease of the large or small intestines. We are therefore reasonably right in coming to the conclusion that this growth involves the kidney.

For purposes of diagnosis we may conveniently divide enlargements of the kidney into two groups: first, those which are solid, and, second, those which are fluid. Placing my hands over this growth and palpating its surface, a sensation of fluctuation is imparted to my fingers. We know, therefore, that this is a fluid tumor and that we may exclude from further consideration all solid forms of growth.

You must not conclude from the results of this examination that you can always so easily determine the physical characteristics of these tumors. In some instances it is impossible to say whether the enlargement is fluid or solid. This is especially true of cystic growths before they have attained a large size.

We have now reached the point in the investigation of this case where it becomes necessary for us to turn to the subjective history of the patient in order to complete the diagnosis. Two statements in this history are important, because upon them the diagnosis of the nature of the tumor depends. I refer, first, to the presence of pus in the urine, and, second, to its absence when the tumor began to grow rapidly last January. Pus in the urine associated with an enlargement of the kidney indicates that the disease is suppurative in character. Again, the fact that when the pus ceased to appear the tumor enlarged rapidly

points to a sudden blocking of the ureter. Unfortunately, we have no record of the amount of urine voided before and after the tumor began to grow, as the question of hydronephrosis would be practically settled if there had been a marked decrease in the quantity at this time. Taking all the evidence into consideration, however, we may conclude that this patient is suffering with a renal abscess plus hydronephrosis.

Having determined the nature of the disease from which this woman is suffering, we will now consider what can be done for her relief from a surgical stand-point. This question practically resolves itself into doing nothing or in performing a nephrotomy or a nephrectomy. Although the general condition of this patient is far from normal, yet she has sufficient strength and vitality remaining to undergo safely a surgical operation. I shall, therefore, consider with you the question of operative interference. One of two operations is indicated,—namely, nephrotomy or nephrectomy. The former consists in cutting into the kidney and evacuating the pus which is present, while the latter is the complete extirpation of the organ. As nephrotomy was performed upon this patient last March without affording any radical relief, the complete excision of the diseased kidney naturally suggests itself to my mind as being the operation most likely to give a permanent result. Before determining upon this operation, however, we must carefully estimate the amount of urine and the quantity of urea excreted. In other words, the functional activity of the other kidney must be thoroughly studied.

As you are aware, the average quantity of urine voided by an adult in twenty-four hours is a little over fifty-two ounces, although it is entirely within the limits of health if a greater or less amount than this be excreted. The quantity of urea normally excreted in twenty-four hours is slightly over five hundred grains, or about two and a half to three per cent. A daily record of the urine which has been kept in this case for the past eighteen days shows that the average amount excreted is about twenty-five ounces. The quantity has never reached more than thirty-two ounces, nor less than fifteen ounces. The urea has averaged between one and one and a half per cent.

During the time the patient has been under observation the kidneys have been stimulated by the administration of citrate of potassium and the free use of Poland water. Yet, notwithstanding this treatment, the daily quantity of urine and urea excreted is far below the normal, showing that the left kidney is also seriously damaged. To perform a nephrectomy under these circumstances would result inevitably in death, and we are therefore forced into doing a second-

ary nephrotomy. Although this operation will not cure the disease, it will establish free drainage and thus add greatly to the comfort of our patient.

I am glad of this opportunity of giving you an outline of the principles upon which abdominal diagnosis is based, and also to impress upon your minds the necessity for a careful examination of the urine before deciding upon the removal of a kidney for disease.

RECURRING CALCULI DESCENDING IN NUMBERS FROM THE KIDNEYS, AND THE CURE OF THE CASES WITHOUT NEPHROTOMY OR LITHOLAPAXY.

CLINICAL LECTURE DELIVERED IN MERCY HOSPITAL, CHICAGO.

BY EDMUND ANDREWS, M.D.,

Professor of Clinical Surgery in the Medical School of North-Western University.

GENTLEMEN,—There is a class of patients afflicted with multiple calculi of renal origin, who are curable without opening the kidney or bladder and without crushing the stones. These cases are not fully discussed in the books, and hence it is important to describe them to you and to show you the proper mode of treatment.

In general terms, the history of a typical case is about as follows. The patient begins to pass small globular stones from the kidneys to the bladder, sometimes from both kidneys, and at other times from one. The calculi attain a rather uniform size, varying from one-eighth to a quarter of an inch in diameter. Some of them are large enough to cause renal colic in passing. They are mostly spherical in form, though not mathematically perfect. Some authors assert that they originate as concretions adherent to the apices of the renal pyramids, situated within the calyces, and that before attaining any considerable size they drop off and pass down to the bladder. (Fig. 1 shows a collection of these stones taken from one patient.)

FIG. 1.



The peculiarity of these cases is that the stones continue to form and pass down all about the same size for a period of a year or two,

or even more. The patients usually expel them through the urethra, and sometimes gather a collection of twenty or thirty as curiosities. If, however, any fail to get out of the kidney betimes, they become enlarged beyond the possibility of escape, and after that nothing but nephrolithotomy can save the life. Also if any are detained in the bladder too long, the increase of size necessitates lithotomy or litholapaxy; but they may all pass freely out with the urine, or if they are detained by an enlarged prostate they can, if taken early, be pumped out, without even crushing them, by one of the modern evacuators.

Here is a patient who is in the middle stage of this disease. About a year ago he was found to have a large vesical calculus, and was lithotomized by an excellent surgeon. Four months later he experienced a return of his old symptoms and called on me for help. I discovered some very small calculi by the sound. I inserted one of Bigelow's large evacuating tubes, and applying the suction-bulb pumped out, without crushing, every one of them, to the number of eight, some as small as the finest bird-shot, and others about three sixteenths of an inch in diameter, and all very hard and very regularly spherical. No more could be felt with the searcher, and the patient seemed entirely cured; but some six months later I had to pump him out again, getting a smaller number of about the same size. Some eight months have since elapsed, and now he comes before us again for relief. Without using the lithotrite at all, I insert at once the large evacuating tube and apply the bulb. You see a number of small globular calculi falling to the bottom of the glass trap. (Fig. 2.)

We get here only five small spherical stones. This patient has an enlarged prostate, otherwise I think he could have evacuated all these little globes by his own natural efforts and without instrumental help. [After this evacuation the kidneys ceased to send down any more stones, and the patient remained permanently cured.]

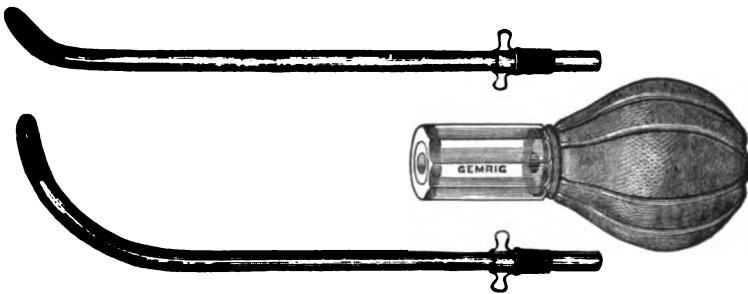
In old men with prostatic obstruction some of the stones are apt to remain in the bladder, and grow to large size, if neglected, while in younger patients they generally pass off early, and when the kidneys get over their stone-producing ailment, as they usually do in a year or two, a spontaneous cure results.

Many years ago an old patient came to me with two moderate-sized stones in the bladder, who had been previously lithotomized by Dr. Brainard, who removed from him about twenty small stones. Evidently the doctor happened to operate on him when the kidneys had nearly ceased to produce calculi, for, though several years had elapsed, I found only two moderate-sized ones present, and the patient knew

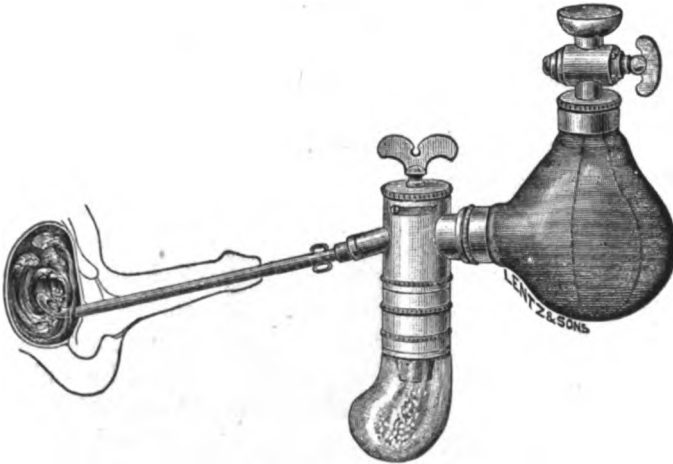
of none passing spontaneously. Had he been kept under observation after the lithotomy and these two stones been promptly evacuated, he would have had no more trouble.

Another elderly patient with enlarged prostate began to pass numerous small spherical calculi, and continued to do so for months. He had repeated attacks of renal colic, sometimes in the right side and sometimes in the left, caused by the descent of the stones. He had passed at least thirty or forty before I saw him. Having etherized him, I inserted an evacuator of large size and pumped out thirty-seven small round stones. There was only one too large to pass the tube,

FIG. 2.



Clover's wash-bottle and tubes.



A more modern instrument.

and that I drew out with a lithotrite without crushing it. His bladder being thus cleared, he was greatly relieved, but in all probability more stones will be formed in the kidneys and descend to the bladder; but they can easily be evacuated, and if this is faithfully done as often

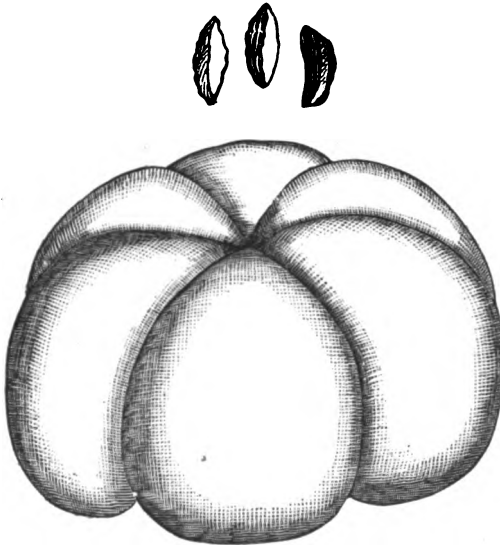
as needed he will be in good health, and after a year or two the tendency to produce the stones may be expected to cease.

Another old patient with prostatic enlargement was accustomed to use the catheter himself, and after a time began to draw out occasional small calculi by catching them in the eye of his catheter. When he failed to get them himself, I drew them out with larger tubes. After a year or two they became fewer and at last seemed to cease to appear. However, after a considerable interval a single one showed itself, and could not be captured by his favorite method with the catheter. He was old and feeble and would not allow me to use any other measures, so the calculus grew apace, and ultimately killed him while under the care of a quack who promised to dissolve it by the potency of his internal medicine.

Had he allowed me to remove the stone by an evacuator when it was small, the operation would have been very trifling and the cure probably permanent.

I now show you a remarkable specimen, consisting of nine stones,

FIG. 3.



removed by lithotomy, which descended from the kidneys into the bladder in two successive periods, separated by a considerable interval of time.

Six of these stones are large and of about the same size. They have smooth facets of apposition which show how they lay together in the bladder. (Fig. 3.) They must have entered the bladder not far from the same period of time and have grown a good while without

receiving any addition to their number. The other three are very small, and doubtless came down much more recently.

My interpretation of the facts is this. A good while ago one of the kidneys began to send down calculi to the bladder. Some may have been expelled through the urethra, but six remained and grew to the

size you see. The kidney now recovered its soundness and ceased for a long time to produce any more. More recently either the same kidney or the opposite one resumed the work and sent down the three small stones. Had the evacuator been used when the first six appeared, they could have all been pumped out without even crushing, and the patient would have remained well until the second crop appeared, when a second application of the evacuator would have again restored the man to health.

My conclusions are these :

1. Although a kidney in some instances retains one or more calculi indefinitely and necessitates a nephrolithotomy, yet in the majority of cases it sends them down to the bladder one after another through a period varying from a few months to perhaps one or two years or more.
2. Generally the kidney ceases after a time to produce any more calculi.
3. In old men with enlarged prostates the calculi are apt to be retained in the bladder by the prostatic obstruction, and may grow to a large size if neglected.
4. The stones at first may easily be pumped out by the evacuator without cutting or crushing, and without any danger, and if the evacuation be repeated whenever new stones descend, the bladder may be kept clear and healthy, and the production of new stones will at length cease in the majority of cases.

HUNTERIAN CHANCRE; PERINEAL ABSCESS; TREATMENT OF URETHRAL DISCHARGE.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY ARPAD G. GERSTER, M.D.,

Professor of Surgery at the New York Polyclinic; Visiting Surgeon to the German
and Mount Sinai Hospitals.

GENTLEMEN,—In this patient you see an example of a trouble which the patient says has existed for six weeks. You have here upon the outer surface of the prepuce a characteristic ulceration. The edges are irregularly punched out, and there is a decidedly infiltrated base. We have a similar ulcer upon the corresponding inner margin. The inguinal glands are indurated upon both sides. There can be no question in regard to the diagnosis. We have here an ulcer with brawny edges and a dirty base,—a Hunterian ulcer of six weeks' duration. There is but little tendency to healing; there is a profuse discharge. The patient has, in addition, a phimosis. The main principle of modern surgery in regard to cleanliness applies whether the ulcer is recent or old, whether it is a Hunterian ulcer or a chancre. We may use this or that acid, this or that powder, this or that prescription, or we may use none of these, and by the application of simple water the ulcer will heal. The frequent removal of the discharge is all that is necessary.

This ulcer is not phagedænic; it is not eating away and destroying tissue. A prolonged bath or frequently-changed moist compresses will accomplish the end in view. For this purpose we may use lint or absorbent cotton. From your absorbent cotton cut a number of pads such as are used by our friends the ophthalmologists, or a little smaller. Place these in a wide-mouthed bottle, and fill the bottle with a solution of corrosive sublimate (one to five thousand), or a salicylic-acid solution, or one-quarter-per-cent. carbolic-acid solution. Don't make your solution too strong. Strip back the prepuce and apply the pad, then return the prepuce to its original state. Change the little compress

every hour, or as often as the secretion collects. In certain parts of the country you will find iodoform used in these cases. I use it myself when pain is present. Even then, however, I do not ladle it on, but simply blow a thin layer over the part; it is not necessary to pile it up in order to get the effect. Whatever your dressing, you should remember that the iodoform alone or the ointment or the plaster is not the most important surgical indication in these cases. Even with iodoform it is possible to form a crust under which the poisonous secretions are sealed up and the ulcer spreads. I am not opposed to chemical remedies such as iodoform, salicylic acid, or calomel: I only object to your allowing the powder to form a crust. No ulcer will heal under a crust. Even the beggars in the street know that. It makes no difference whether you have a chancroid to deal with or a specific ulcer, the local treatment is the same. Again, you cannot always tell whether you are dealing with a specific lesion or not. You may have a sore with a soft base,—a sore which will heal within two to four weeks,—and from these indications you may be pretty sure that no general disease will develop, but you cannot be certain. Both in my own experience and in that of others the patient has, upon these indications, been assured that he has not contracted syphilis, and at the end of six weeks he has been covered with a rash from head to foot, he has had sore throat, he has had iritis. A soft ulcer can be followed by syphilitic manifestations. On the other hand, you may have an indurated sore and these symptoms may not develop. The rule that we have two distinct forms of ulcer is founded upon a correct basis; it is based upon observation, but it is not a law. The soft ulcer may develop induration, and yet months and years may elapse without the appearance of syphilitic symptoms. The indurated ulcer is not necessarily syphilitic. Every indurated ulcer, then, is not followed by syphilis, nor is the rule that no soft ulcer is followed by syphilis without exceptions.

In the treatment of this case place a piece of moist cotton between the prepuce and the glans, so as to avoid contact of the two surfaces, and place rubber tissue around the whole, to prevent drying. Direct the patient to change the dressing every hour. The blunt end of a hair-pin answers excellently for getting the cotton into place. In case of phimosis it is sometimes necessary to relieve this by operation; this is not, however, necessary in all cases. Some teachers direct that all such cases should be operated upon, others that none should be operated upon. The modern physician should not accept any such cut-and-dried rules. In many cases of phimosis we can gain sufficient access for local treatment. If, however, we cannot, and the tension is great,

clipping of the prepuce is indicated. I have no objection to this operation when it is clearly necessary.

Patients with non-specific sores will come to you asking whether they have a chancre, whether they have contracted specific disease, wanting you to assure them that such is not the case, or asking you to put them upon preventive treatment. They want anti-syphilitic medication "by the system," before the poison has been absorbed. I advise you never to complicate your diagnosis by the exhibition of mercury before constitutional symptoms have been developed. It is a most important matter that you should know whether your patient has syphilis or has not syphilis. By giving mercury during the primary lesion you may suppress constitutional symptoms. You may then erroneously assure the patient that he has not contracted syphilis, and for months there may be no developments, when suddenly violent manifestations may appear and valuable time will have been thrown away. Such patients have even married, and only known that they had syphilis when, years after, syphilitic children came one after the other into the world. We allow an average of three years for the course of this disease. In some cases five or six years are consumed, in others two years. The question, therefore, as to whether anti-syphilitic treatment should be immediately commenced or should be postponed six weeks is immaterial in the result, while to the patient such postponement is of the greatest advantage. The patient ought to know positively whether he has syphilis or not. If he has syphilis, there are certain things which are denied to him. For a number of years he must not marry; he must not touch any decent woman during that period. To hang such a sword unnecessarily over a man's head is one of the worst of inflictions. If you administer mercury during the primary stage, the secondary symptoms are masked so that you are unable to make a reliable diagnosis. I would limit my treatment to local measures during the primary stage, and I would wait for the rash to appear, for the glands to become involved, for the hair to commence to fall out, before beginning constitutional treatment. If at the end of three months after the appearance of the sore no constitutional symptoms develop, you can then confidently assure the patient that he has not syphilis and that he does not need mercury. I would never treat constitutional syphilis until I got constitutional symptoms, and then I would treat it energetically.

PERINEAL ABSCESS.

The next case is that of a man with perineal abscess following gonorrhœa, and caused probably by the presence of a stricture. You have an ulceration behind the stricture, the ulcer penetrates the perineal tissues, and abscess results. This abscess should be incised, and incised early. You may object that by this procedure we shall encourage the formation of a urethral fistula. Fortunately, this does not often occur. You must remember that the fistula already exists; while the incision, if done early, stops the destruction of tissue and acts as a conservative measure. The local trouble removed, the urethra must receive attention and the stricture be treated either by dilatation or cutting.

CHRONIC URETHRITIS.

The next case is one of chronic inflammation of the urethra, with a discharge dating back two years ago, but slightly increased in the last three weeks. We have here a number of peculiar changes in the skin of the prepuce and glans: there is itching, there is a rash, there is denudation of the epithelial layer, there is infection of the prepuce with the poisonous discharge. He has a peculiar swelling of the joints, which were very painful at first, but are now better. Where we have pain confined to a single joint, with pallor and œdema, we may look for a urethral discharge, gonorrhœal or otherwise. This is what we call urethral rheumatism, and the treatment consists primarily in the treatment of the urethritis. The treatment of the urethritis should be commenced with mild solutions. I never use strong solutions at first, and seldom at all. In this case we may use the sulpho-carbolate of zinc (one-per-cent. solution, or thirty grains to the six ounces). Where the urethra is extremely sensitive we may use a solution of the permanganate of potassium (one to two thousand), gradually increasing the strength to one to five hundred. Gauge the strength of these solutions by the sensitiveness of the patient.

A later application may be a one-quarter-per-cent. solution of the nitrate of silver. This injection should not be made frequently, if a good deal of smarting is occasioned. Of the milder solutions, six, eight, or twelve injections may be made in the course of twenty-four hours. The syringe used should have a blunt, dull point, not a sharp nozzle,—such as is used in giving enemata to children. The rule for these injections is to have the patient first pass water; to expel the air from the syringe; to have the solution warmed; to grasp the glans with the index and middle fingers of the left hand and to press open

the meatus; then to take the syringe in the right hand and place it against the orifice of the urethra. The syringe should hold not more than three-eighths of an ounce, and only half a syringe should be injected the first time. Having made the injection, compress the orifice of the urethra and take the syringe away. If now the contents escape in a stream, the injection has been properly made; if they do not escape in a stream, the injection has not entered the urethra. It has happened to me to be consulted by a man who had had a discharge for fifteen months, and who during that time had used injections, and never had made a real urethral injection. Not a drop of the injected fluid entered the urethra, and he had simply flushed the preputial pouch; his doctor had never shown him how to inject properly. I usually order two injections,—the first to be immediately passed and used in order to wash out the urethra, and the other to be retained for two minutes by the watch.

In using the nitrate of silver two injections per week are, as a rule, sufficient, and these I give myself. After this injection there will be probably local pain, and on the following day the discharge may be increased; it may be bloody, even, or thick and tenacious, but the following day it will be more watery, and with each treatment the reaction should be briefer in duration. Where the patient is especially unreliable, I recommend irrigation of the urethra. Take a small, straight female catheter, English No. 7, 8, or 9 in size, with a slightly-curved beak, lubricate it with glycerin, and gently introduce it into the urethra. Insert until you meet with resistance, then stop; the depth varies with the individual. The cause of the resistance is the cut-off muscle. Then fill a large three-ounce syringe with a tepid and mild solution of permanganate of potash, and inject through the catheter. The injection does not enter the bladder, but passes back along the side of the catheter. For such an injection about a pint of the solution is used.

In urethral rheumatism the joint should be treated as for a local surgical complaint, immobilizing the limb on a splint, and making local applications through the fenestra. By local treatment you may often prevent destruction of the joint; you may prevent ankylosis,—an accident which follows urethral rheumatism more frequently than rheumatism of any other variety.

Gynæcology and Obstetrics.

THE RISKS OF SYPHILITIC INFECTION INCURRED BY GYNÆCOLOGISTS.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY HOSPITAL, PHILADELPHIA.

BY WILLIAM GOODELL, A.M., M.D.,

Professor of Gynæcology in the University of Pennsylvania.

GENTLEMEN,—You will remember that a few weeks ago I performed an abdominal section—or coeliotomy, as my friend Dr. R. P. Harris very learnedly and correctly calls it—on a patient who had venereal disease. I then promised you that I would make a few remarks upon the risks which gynæcologists and obstetricians run in their professional attendance on such patients. I did not have the time on that occasion; but to-day, as the coeliotomy which I have just performed was an easy one, I have more than half an hour at my disposal. So, as this is my last lecture, I shall devote the remaining portion of my hour to redeeming the promise made to you.

When I was a student of medicine there was a gentleman in one of the classes who, just at the time of graduation, broke out from head to foot with an unmistakable syphilitic eruption. On the score of immorality he was refused his diploma by the dean of the faculty, who at once recognized the character of the disease. This was the first intimation the student had received that he had contracted such a disease, and he was thunderstruck. He denied positively that he had ever had sexual intercourse with any woman, and insisted that the dean was in error, but the latter refused to believe him. The student then remembered that, while on duty at Deer Island Hospital for Prostitutes, a sore appeared on the index finger of his right hand. As it refused to heal, he showed it to the late Professor Joseph Pancoast, who, not suspecting its origin, prescribed some simple ointment. It still kept running, and he got advice from his professor in surgery,—the late Dr. Thomas D. Mütter,—and also from other physicians, all of whom never suspected its character. After the lapse of weeks it healed up, but then his health began unaccountably to fail. Finally, at the beginning of the examinations he broke out with a syphilitic rash.

Fortified with these facts, and armed with affidavits from Professors Pancoast and Mütter, and also from the Deer Island officials, he presented himself again to the dean and was accorded his diploma, but he was too disfigured by the eruption to appear on the stage to receive it. Now mark the subsequent history of this unfortunate man. He put himself on a course of medicine and thought he was cured. He then went out West, prospered, and married. To his keen disappointment, his wife had a series of abortions and premature labors at from two to four months of pregnancy, and he finally put her as well as himself on a prolonged course of treatment. She now went to term, and they were both delighted beyond measure to think that they would at last have a living child. He himself attended her in her labor; but, alas! a dead child was born, rotten with syphilis. Springing up from his wife's bedside, he rushed up-stairs and in his anguish shot himself dead! I told this tragic story to a class of medical students some years ago, after I had exhibited to them a dead syphilitic child which I had delivered the evening before. This lecture was published, and a few weeks later I received a letter from a distance asking for further information about this physician, and stating that his history, up to his departure for the West, was analogous to that of the writer's uncle, his mother's favorite brother, whose death was to them shrouded in much mystery. It was he.

Here was a bright young man, who, in his desire to increase his knowledge, had spent his vacation in a venereal hospital, and had been ruined by his devotion to science. It ought to have been a very great warning to me. Yet I paid but little heed to such a source of danger in my own practice until a stubborn sore appeared on the index finger of my right hand. It refused to heal, and I showed it to the late Dr. Agnew and to others, who pronounced it to be syphilitic. Professor Agnew cauterized it, and put me on a course of mercury, which I bore badly. For several weeks I was the most unhappy man in Philadelphia. Finally the sore healed up and I waited anxiously for constitutional symptoms, but they never appeared. So I suppose the diagnosis was an incorrect one.

Before many months elapsed I met a medical friend of mine who was carrying his right hand in a sling. I asked him the reason, and he told me that he had an indolent sore on his index finger. "Can it be syphilitic?" I inquired. "Oh, no!" he replied. "It is a poisoned wound." He then told me that he had shown it to the late Dr. Richard J. Levis, who corroborated that opinion. Now, Dr. Levis was an authority on syphilis, and knew all its tricks and its manners, so

from his opinion there was no appeal. Yet, as the sore refused to heal, I kept venturing to suggest a specific source, until my friend finally got angry with me. His health now began to fail; he lost the color of health in his face; he had ill-defined symptoms, and was at last confined to his room by some obscure lung-trouble, which puzzled his physicians. I could stand it no longer, so I entered his bedroom and told him I had come to make a "deliverance." I said, "You have syphilis; you had it in your finger; your constitution is now infected by it; and unless your physician treats you for it, you are a doomed man." He was somewhat offended, and laughed me to scorn. But a few days afterwards a splendid crop of rupia appeared on his forehead. He was now put under active treatment, and fortunately got perfectly well, but after a long and tedious illness.

I knew a physician who was an athlete in size and in vigor. Now, during our late civil war many of our soldiers got their morals badly shaken and came home diseased. This physician attended the wife of one of these soldiers in her confinement. Shortly after, an indolent sore appeared on one of the fingers of his right hand. It was, as is usually the case, unrecognized. Then ill-defined constitutional symptoms set in. Finally he became aphasic and paralytic. A consultant now recognized the disease, and by heroic doses of potassium iodide saved his life, but that was about all. For years he had to give up his practice, and to get about painfully with the aid of two crutches. Now he can walk slowly with the aid of a cane, and has lately resumed merely his office-work.

I had a medical friend in this city who rejoiced in a handsome beard, thick eyebrows and long eyelashes. In an obstetric case he became infected, and lost every vestige of hair from the crown of his head to the sole of his feet. For months his life was in danger, but ultimately he did succeed, after a desperate battle, in eradicating the poison from his system. His hair and health returned, and he is now the father of several healthy children.

Not very many years ago a lady physician whom I knew wounded herself while performing some surgical operation on a syphilitic patient. She became infected and was never able to eradicate the disease from her system. It finally destroyed her life.

Shortly after the death of this lady I had a woman in this hospital who was saturated with the poison of syphilis,—fairly rotten with it. She had a very offensive ozæna, a syphilitic sore throat, nodes on her bones, osteocopic pains, albuminuria, and a rapidly-growing ovarian tumor. She was in very bad health, and it was a bad case to touch,

but it was necessary to interfere. The operation was complicated by very extensive adhesions, and she lingered on for a few days, dying from sheer exhaustion. While sewing up the abdominal incision, to my dismay I ran a needle into my finger. Not wishing to suck out any virus that might have entered the needle-track, I squeezed the blood out of the wound and put the finger into a one to five hundred bichloride solution, where I kept it for some time, occasionally giving it a squeeze while it was immersed. I am sure that I ran some danger of infection, and I was alarmed. For some time afterwards I looked at my finger many times every day, and imagined that I felt pain in it. I even thought that the axillary glands were enlarged, but it was only my morbid imagination.

You see that in all these cases the sore is ectopic,—that is to say, it is out of its usual habitat,—and for that reason it is not recognized, even by skilled physicians, until the whole system is infected and salient and unmistakable constitutional symptoms arise. Then, unfortunately, the disease has got the start.

To illustrate this point, let me give you a history. A few years ago an uncommonly good-looking lady, with a fine head of hair, thick eyebrows, and long eyelashes, was under my treatment off and on for several years for a retroversion of the womb and some local congestion. I had not seen her for a number of months, when she came in one day to have me see whether her pessary was in place. I remarked that she was not looking well, and told her so. She said, "I have an ulcer in my left tonsil, and Dr. Agnew is treating me for what he calls sewer-gas poisoning. The plumbing in our house is out of order, and my husband and I have gone to a hotel so as to have new plumbing put in." I looked at the sore. It was ugly enough, and quite livid all around. As she got no better, Dr. Agnew referred her to one of our best specialists for the throat. He began to treat her for the sore, very naturally taking his cue from Dr. Agnew as to its origin from the sewer-gas. She came again to see me about her pessary, and I looked at her throat again. Now, I did not and do not know, by any manner of means, as much about syphilis as Dr. Agnew did, nor had I Dr. Levis's large experience in the treatment of syphilitic diseases, but I could never forget the sore on my index finger, for a burnt child dreads the fire, and I had syphilis on the brain. So, with many apologies for the liberty, I wrote a note to the throat specialist suggesting that the sore tonsil might be due to syphilis. He very courteously replied that he did not think so. But very soon the characteristic eruption appeared all over her body, and then she had a desperate fight with the disease.

She lost a fine head of hair, all her eyelashes and eyebrows. Even the hair on the pubes disappeared. She had syphilitic iritis, and her whole appearance changed to such a degree that some of her relatives did not recognize her on the street. Her beauty wholly disappeared, and was replaced by that syphilitic mask which cannot be described, but which, when once seen, can never be forgotten. The nearest approach to it is the livid appearance of a person who has been disfigured by small-pox, but who is standing at such a distance from you that you cannot distinguish the pits on his face. By heroic doses of potassium iodide and by a prolonged course of mercury the disease was finally controlled. Her hair came back, but not her beauty. Her eyes are still somewhat bleared, and her complexion is coarse. She reminded me of a ship which, after encountering a great storm, gets safely to port, but in a crippled condition.

Many years ago, when I was at the Preston Retreat, a woman came there for confinement. She had a narrow pelvis, contracted in its antero-posterior diameter. I had applied the forceps, for there was a prolapse of the cord, as is often the case in narrow pelves, and she was with difficulty delivered, but not of a living child. About six years afterwards she reappeared and asked to be readmitted, as she was pregnant. When she went into labor I found her vulva and buttocks one vast stinking specific ulcer. The forceps, I knew, would have to be applied. I would have given one hundred dollars to be out of the scrape, but there was no help for it. We did not in those days know the virtues of mercuric bichloride. So I covered my left hand with carbolated vaseline and used only that hand to put in both blades of the forceps. Just as soon as I locked the blades I washed that hand most thoroughly. If I remember correctly, a puny child was born alive, but within a few days afterwards the characteristic nasal catarrh appeared and it probably died. I do not know its history, because its mother became so offensive from her sores that I bribed her to leave the institution. Such cases every one of you is liable to meet with in your professional work, and you must be on your guard against being infected.

A few years ago we had a woman in our ward-class whom every member of the class examined, and I repeatedly, so as to coach the students. After we had got through, she said, "Doctor, I have a sore on my privates which I wish you to examine." On lifting up the sheet I discovered on one labium a large venereal sore. When I showed it to the class there was a good deal of excitement. Some turned pale, one was nauseated, and there was a great washing and scrubbing of hands.

All of us felt very uneasy, I among the rest, and we all examined our index fingers to see whether any abrasion or hanging nail existed. Fortunately, none of us were infected, but you see the danger was great. Now, every year there are analogous cases by which the health of physicians is ruined and their life indeed destroyed. This infection usually occurs in obstetric operations, for if any difficulty in delivery arises one has to put one's fingers repeatedly into the vagina, and they are often kept more or less sodden by the secretions. Then, the sore on the finger being ectopic, or out of its ordinary and natural place, it is not recognized until the disease has become established.

Here is another instance of ectopic infection. Cracked nipples are common in wet-nurses, and they are not readily cured so long as they nurse. Now, a wet-nurse may have her nipple infected through giving the breast to a child which has congenital syphilis. The physician may mistake the lesion for an ordinary sore nipple, and so treat it until the woman's system has become infected by the disease. Such cases have repeatedly happened, and have been the grounds for a law-suit against the parents of the child, but I do not think that a physician has ever been prosecuted for making so natural a mistake.

Another danger which a physician incurs is that from gonorrhœal poison. Physicians have lost an eye by a stray drop when syringing out the eyes of children affected with gonorrhœal ophthalmia. I have personally known two such cases. One of them was that of a distinguished lady physician, one of the pioneers of the female medical profession. From this cause I have had several very narrow escapes while syringing out infants' eyes. Fortunately now, since the profession have universally adopted antisepsis in midwifery, gonorrhœal ophthalmia in infants is being almost wholly stamped out. Before the days of antisepsis I met with repeated cases; in two of them the infant wholly lost its sight, and our asylums for the blind were largely peopled by them.

In to-day's talk to you about ectopic venereal sores, and the risks which we, as practitioners, run of becoming infected by our patients, I have tried not to frighten you away from performing your duty, but to put you all on your guard. Perhaps I ought also to add that my own personal experience—that sore on my index finger which embittered my life for many weeks—made a very great impression on me, an impression which would tend to make me magnify rather than minimize the dangers of such infection.

ABDOMINAL SECTION.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON HOSPITAL, PHILADELPHIA.

BY E. E. MONTGOMERY, M.D.,

Professor of Gynecology, Jefferson Medical College; Obstetrician to Philadelphia Hospital; Gynecologist to St. Joseph's Hospital.

GENTLEMEN,—As a preliminary to the operations I propose to do before you to-day, I bring three patients upon whom operations have been recently done for diseased conditions within the abdominal cavity. These patients were operated upon the same afternoon, and in the details of the operation, in the conditions demanding the procedure, and in the convalescence, matters are presented of interest and importance.

CASE I.—The first patient is a woman twenty-five years of age; the menses appeared at eleven and a half years, were regular and painless. She married at thirteen years, and at fourteen and a half years gave birth to her first child, which is now living and healthy. She miscarried a year or so later at three months. Her last child was born when she was seventeen years old, and from its birth her present trouble began. She had intermittent severe pains in the uterus for two or three months following childbirth. Menstruation was regular as to time, but very profuse and prolonged. The uterus and right ovary were sore and painful. Coition gave great pain, and she continually suffered from a tired, draggy feeling. Her stomach was irritable, she had frequent headache, her bowels were constipated, and she suffered from internal hemorrhoids, which were large and painful. Upon examination the uterus was found tilted back, the fundus in the posterior cul-de-sac, and the os directed forward. A mass was felt at the right side of the uterus, which presented but slight movability and was quite painful. There was thickening, also, of the left broad ligament. This patient underwent an operation on the 8th of the present month. Her history would indicate that she had an extension of inflammation to the pelvic organs as a result of sepsis, this attack of sepsis keeping her in bed for nearly two months subsequent to her delivery. It is not

impossible that the sepsis has arisen as a result of gonorrhœal infection which was present in the uterus during her pregnancy. The distress and pain in the pelvis, aggravated by the marital relation, incapacitated her for a useful life. She was, however, extremely desirous that her opportunities for child-bearing should not be destroyed, so that in performing the operation I was anxious, if possible, to escape with the removal of the appendages upon one side.

In opening the abdomen, however, and finding that the mass upon the right side involved ovary and tube, and that upon the left side the tube was completely occluded by inflammatory action, the absolute impossibility of restoring the function should the organs be left was demonstrated, and the diseased condition present would probably render imminent the necessity for a second operation in the near future. For this reason both organs were removed. Her convalescence was not attended by any eventful symptoms, the temperature never having exceeded 100° F., which was as satisfactory as we could expect in a general hospital.

CASE II.—The next patient I bring before you is a woman also twenty-five years of age, who was quite healthy in her early life. She has been married some three years. She gives a history of having had some three abortions; she has also had chancres, a suppurating bubo, and severe attacks of gonorrhœa. The present trouble was brought on by a criminal abortion. She suffered from pain, fainting-spells, and considerable elevation of temperature; pain has been marked in the left side of the pelvis, and she complains now of continuous aching there. Upon examination a mass can be felt posterior to the uterus. The pelvis is filled up; the uterus is more or less surrounded by exudation, and upon pressure indicates the presence of fluid. This condition is that which was formerly described as cellulitis or parametritis, a condition which we now recognize to be due entirely to the inflammatory exudation about the diseased tubes; in other words, a condition of perisalpingitis.

In performing the operation, it was found that the adhesions were quite extensive, that the mass upon the left side was as large as an orange, being a thin-walled sac filled with pus, which, in spite of careful efforts at enucleation, ruptured under the hand. Pus, however, was quickly sponged out, a wall of sponge having been previously applied over the intestines to prevent their soiling through such an exudation. The sacs were carefully peeled out, and both ovaries and tubes removed. The pelvis was thoroughly cleaned, packed with sponges, and the sutures then introduced. Finding, however, before tying the

sutures, that there was still some oozing, a glass drainage-tube was inserted, and it is owing to the infection of the track of this that we have had some suppuration above the rectus muscle.

The patient has not had a high temperature during the progress of the convalescence, but the recovery has been delayed by this exudation. The opening, however, has nearly healed, and is granulating as rapidly as we could expect. In such patients, instead of the glass drainage-tube, I prefer the method of drainage recommended by Mikulicz, which consists in the introduction of a gauze bag to the bottom of the pelvis, which may be packed with gauze. In this way pressure is exercised upon the surface, capillary drainage is effected, large quantities of fluid may be removed, and yet the patient will experience no inconvenience, and will not run the gauntlet of dangers from infection which necessarily results from the use of the open drainage-tube in the wound with the patient in the ward of a large hospital. In this patient the condition was, without doubt, one resulting from the extension of gonorrhœa through the uterus to the tubes and ovaries.

CASE III.—The third patient is a woman who underwent operation the same day as the previous cases. She is thirty-two years of age; menstruated first at seventeen years; she has never been regular, going sometimes five and six weeks, and then the flow lasting only for a day. She suffers from considerable dysmenorrhœa; pain occurs just before the flow. She is a woman who has worked quite hard. Some four months ago she had her sickness, and ever since there has been a slight blood-flow. Pain was constant in the right ovarian region. During the last four months, she has not, however, had as much pain with the flow as formerly. Upon examination it was found that her uterus was retroverted, and that the ovaries were prolapsed, resting behind the uterus and more or less pressed upon by it. This condition of itself would be sufficient to bring about pain and discomfort, the congestion of the ovaries resulting from locally induced and increased congestion of the uterine mucosa, leading to bleeding. Upon vaginal examination by the speculum it was found that the cervix was abraded, the os showing evidence of endometritis. The mucous membrane itself had undergone thickening and abrasion, points of thickening having resulted more than likely in the formation of small mucous polypi, and these kept up the irritation and the tendency to bleeding.

As a preliminary step in the treatment of the patient, we dilated the uterus, curetted its cavity, washed it out, and packed the organ with iodoform gauze. This treatment by gauze serves to keep the inflamed surfaces apart, has a marked influence upon the tissues by

pressure, and through its capillary action effects thorough drainage. The uterus, however, was retroverted and resting backward upon the ovaries; we could without much difficulty replace the uterus, but it was difficult to maintain it in the replaced position by the use of the pessary, for the reason that this instrument would press upon the inflamed ovaries, increasing the discomfort of the patient. In such cases I have not infrequently seen an ovary slip down behind the bar of the pessary, and the patient caught in some attitude of the body and be unable to change her position as a result of the pressure. So for this reason we could not hope by ordinary means to remedy the distress of the patient. We then opened the abdomen, raised up the uterus, brought forward the ovaries and tubes, and by a suture introduced in the broad ligament at the end of the tube fastened this structure to the anterior peritoneum near the point of exit of the round ligament. This was done upon each side of the abdomen, and then the uterus fixed to the abdominal parietes by the introduction of the last two sutures through the fundus. In fact, this uterine fixation was practised in all three of the patients operated upon in one day. It may be of interest to know, also, that in all these patients the operation was done with the patient in what is known as the Trendelenburg posture. In addition to showing you these cases and thus impressing upon you the necessity of operation in a similar class of patients, I have brought them before you for the purpose of demonstrating the proper apposition of the wound-surfaces in closing.

CASE IV.—I propose to bring before you another patient, a woman who underwent an abdominal operation some three years ago for an extra-uterine pregnancy. The woman is twenty-nine years of age and fleshy. She recovered from the operation without unpleasant symptoms. Nine months later she noticed a small lump in the line of the incision. This increased in size and was painless. She was delivered of a child thirteen months ago, and she has not noticed that the tumor has increased very much in size. It is now about the size of a cocoanut. Examination of the surface shows that at several points there are intestinal adhesions, so that when the hernia is pushed back these points are irreducible. The general health of the patient is quite good, and she comes before us willing to submit to a second operation with a view to the relief of this condition. It is important always, in performing abdominal operations, particularly to close the wound so as to preclude, if possible, such an occurrence as this. In making this statement, I do not by any means censure the method of operating in this particular case, for I am painfully

aware that, exercise every precaution we may, instances will occasionally occur in the progress of the convalescence, or complications in the operation itself, which will render us unable to effect completely the union of the wound we desire. No one is justified in condemning the method of procedure in a case which comes under his observation, when he is unaware of the complications that may have arisen during convalescence, and is also aware that he has had similar conditions himself. Such accidents, however, do not preclude the necessity of exercising every precaution we can to prevent their occurrence. Frequently the difficulty may be obviated by exercising proper care in the closing of the wound and remembering that the aponeurosis is the most important structure in maintaining the permanent closure of the abdominal wound.

TECHNIQUE OF ABDOMINAL OPERATIONS.

As this is the first time I have had an opportunity to appear before you for the performance of an abdominal operation, it seems important that I should say something of the technique of the procedure, and impress upon your minds the importance of exercising every precaution to prevent the introduction of pathological material into the wound, accidents which will, of necessity, influence the subsequent convalescence of the patient. In preparing for the operation, then, we are particularly careful with regard to the preparation of the patient. We will have her given, two days before the operation, a brisk cathartic, to remove from the alimentary canal material which through its walls might lead to infection of the abdominal cavity. We have the abdomen of the patient thoroughly cleansed, the hair from the pubes and genitals shaved, the abdomen washed with soap and hot water, using the flesh-brush freely, afterwards with a sublimate solution, and then a pad, wet with the latter, placed over the abdomen and kept in place until we are ready for the operation. The operator and his assistants should thoroughly scrub their hands and arms; coats should be removed, the arms bared to the elbow; after thoroughly cleansing with soap and hot water, wash with a one to one-thousand acid sublimate solution, then bathe with alcohol. The operator places a linen coat or gown or sterilized sheet over his clothing, so that nothing is likely to come in contact with the wound from his person. The instruments have been sterilized by heat in the steam sterilizer, placed in clean trays, and covered with hot sterilized water. The importance of these precautions cannot but be appreciated when we remember that the peritoneum is a large, active, absorbent surface, which also has the function of secreting

fluid. Any disturbance of its function by the presence of septic material may lead to transudation of fluid, which acts as an excellent culture-medium, and the subsequent absorption of the ptomaines resulting from sepsis will lead to high temperature and all the symptoms of blood-poisoning. For cleansing the hands I know of no better agent than the ethereal tincture of soap made by Mr. Johnson, the chief of the male wards of this hospital. This material dissolves off the fatty substance of the skin and promotes thorough cleansing. In preparation for an operation the sponges afford a source of great care and anxiety. They should be prepared by taking proper sponges, placing in a towel, beating them with a cane until the dust and sand are loosened, then placing them in a solution of muriatic acid (one to sixty), allowing them to remain in this from twelve to twenty-four hours, so as to dissolve out the lime salts. The sponges are then placed in a solution of hyposulphite of soda, one pound to the gallon of water, to which is added an ounce of muriatic acid. This leads to a double decomposition, in which sulphur and sulphurous acid are set free, by which the sponges are bleached and all foreign materials burnt out of them. They should not be permitted to remain in this solution, however, longer than ten minutes, as otherwise their fibre will be injured. They are then washed until the sulphur is entirely removed from them, after which they are placed in a five-per-cent. solution of carbolic acid, which should be changed at least every two weeks.

Having the patient properly anæsthetized, she is now brought before you, the abdomen exposed, the upper part of the body covered with a sterilized sheet, another sheet over the lower part, and sterilized towels pinned between these, leaving exposed only the narrow space through which the abdominal incision is to be made. This surface is brushed over with a solution of iodoform in ether. As we have here a large pendulous mass forming the sac of the hernia, and adhesions can be distinctly felt within it, we make our incision at the lower portion, in order not to injure any portion of the adherent viscera.

In opening into the sac, I will ask my assistant, Dr. Fisher, to hold up the tissue on one side, and I will hold it up on the other and cut through this fold with a knife. In so doing I find, by my fingers directed into the hernia, that I have not injured its contents. I now peel off the omentum, finding the entire adhesions to be omental rather than intestinal, although a knuckle of the intestine has pushed into the sac. Having torn off the omentum around the entire surface of the sac, and pushed it back, it is held in place by sponges and cheese-cloth pads; we now split up the sac to the upper border of the ring. The ragged

peritoneum is then cut through down to the ring and the muscular ring itself split, forming in this way two flaps. Before closing the wound, we examine the condition of the omentum, and it is fortunate that we do so, for, in addition to the slight bleeding which takes place from the adhesions, we find a number of openings through it into which coils of intestine might pass and a severe obstruction of the intestine take place.

Such cases have resulted not infrequently in the death of the patient, with symptoms of intestinal obstruction. The posterior flap and peritoneum are brought together by a row of silk-worm-gut sutures; a second row is then introduced to the outer flap and the aponeurosis. After tying these two rows of sutures, and sponging out the cavity thoroughly, we take a third row of sutures in the skin. Before introducing these, however, we cut away a portion of the pendulous tissue, which is made up only of skin; a thin layer of connective tissue and peritoneum is cut away as being useless, and difficult also to bring over the wound. In this way I am sure we have the ventrum so reinforced that it is improbable that a subsequent hernia can result. The wound is carefully washed off, dried, dusted with aristol, covered with iodoform gauze, and over this a layer of aseptic gauze, all held in place by strips of plaster on each side, to which tapes are attached and these tied together over the dressing. It is then finally fixed by means of a bandage. No anodyne will be given if we can possibly avoid it. The patient will be kept quietly in bed; nothing given by the mouth until her stomach is quiet. If she complains of thirst, injections of water will slowly be thrown into the bowel. The dressing will not be disturbed for over a week, and then the sutures will be removed. If there is any abdominal distention, turpentine enemata will be given, and these followed not later than the second day by the use of salines.

CASE V.—The next patient I bring before you is a woman forty-five years of age. She is married and has had six children. She has been healthy, and menstruation undisturbed, until about six months ago she noticed that there was an enlargement on the right side of the abdomen, low down; the tumor was hard and smooth. Three months later she had a heavy feeling in the abdomen, with dragging sensation, and the abdomen has begun to increase in size uniformly. Shortness of breath followed; the last five or six days vomiting has been very free. She suffers from pain all over the abdomen; fluctuation is distinct and is quite dense and very full. She was brought to the hospital supposing that the condition was a fibroid tumor, which has given rise to ascites. It should be remembered, however, that similar conditions may be induced

by other growths. Thus, we may have malignant disease of the omentum, growths of the ovary, as well as of the uterus, disease of the kidney, of the liver, and of the intestines, which may give rise to ascites. The patient was brought in partially under the influence of an anæsthetic, and was found to be so cyanosed that her skin was perfectly black: respiration was exceedingly feeble, and it was found necessary to proceed at once to incision of the abdomen in order to save her from immediate death. An incision was quickly made, cutting directly through the abdominal walls to the length of an inch and a half, until the peritoneal cavity was reached. There was a gush of bloody fluid, and the flow of this was promoted by introducing two fingers into the wound and separating them so that the intestines could be held back. Some five gallons of fluid were emptied out in this way, and the patient improved in appearance as the fluid was withdrawn. She was given hypodermic injections of strychnine and of atropine, while inhalations of nitrite of amyl were also administered.

As the fluid flowed away, the supposed fibroid tumor proved to be a malignant mass which had originated from the omentum. The entire abdominal cavity was studded with masses of malignant disease, and the rapid effusion which had taken place and was so bloody in character was more than likely due to the obstruction of the portal circulation. The fact that she had had considerable vomiting for the last four or five days led to the supposition that there was more or less complete compression or obstruction of the intestine, so that with such a group of symptoms the outlook for the patient was an exceedingly unfavorable one, and it was decided to do nothing more than empty the cavity. A large quantity of fluid still remained, however, that could not be emptied by compression. Drainage was therefore indicated. This was preferably exercised by means of the gauze drain rather than the glass, as it was felt that the glass drain introduced into the abdomen would be likely to irritate the malignant mass and increase the tendency to hemorrhage. A gauze drain was introduced in the lower angle of the wound, and one suture inserted above in order to keep the wound from gaping. It was felt that the gauze drain would be amply sufficient to accomplish the emptying of the cavity.

In considering this case, gentlemen, I wish it to be an object-lesson which will impress upon you the importance of being careful not to commit yourselves to a diagnosis in any condition in which the physical signs are obscure. As we have already said, such a condition of affairs may arise from a number of diseased conditions. This patient is be-

yond hope, other than a simple palliation of her present distressing symptoms.

Note.—Hypodermic injections of strychnine were repeated, one-twentieth of a grain, every two hours during the night. The asphyxia became less marked and breathing more easy and the patient more comfortable. The drainage through the gauze was very free. The attention of the attendants was called to the fact that fluid was dropping on the floor, and it was found that the drainage from the gauze had led to fluid soaking through the dressing and passing through the entire mattress. The afternoon of the second day the patient was found in a much more comfortable condition, and there had been no vomiting. The abdomen was flat; slight tympanites in the early part of the day was relieved by turpentine enemata. While the outlook for the patient is bad, yet her present condition is far better than could have been expected.

DIFFICULT ABDOMINAL SECTIONS.

CLINICAL LECTURE DELIVERED AT ST. LUKE'S HOSPITAL, CHICAGO.

BY HENRY T. BYFORD, M.D.,

Professor of Gynæcology, College of Physicians and Surgeons, Chicago; Professor of Gynæcology, Chicago Post-Graduate Medical School; Professor of Clinical Gynæcology, Woman's Medical College; Gynæcologist to St. Luke's and Woman's Hospitals; Consulting Gynæcologist to the Michael Reese, the Provident, and the Charity Hospitals.

GENTLEMEN,—It is often said that a large amphitheatre like this is no place to teach abdominal section. It is said that operations, and particularly abdominal sections, should be done before small private classes. It is of course necessary, before becoming laparotomists, that each of you must be present at a number of private operations, and should act the part of an assistant at private operations many times. Now, this is as true as the gospel, but no more true than that, before you can reap full benefit from private operations, either as spectators or assistants, you must at the general clinic learn your A, B, C of abdominal surgery. The best way to learn a language is to be about where it is spoken by natives, and pick up almost unconsciously the pronunciation, words, and expressions at the same time or even before an attempt is made to master the grammar. By giving all of you a chance to witness all of the abdominal sections available, I cannot teach you from the first to operate, but can show you both simple and complicated cases, discuss them carefully, and make you familiar with the subject in a practical way; after that you will be better able to understand what you should do and learn how to do it when you are called upon to assist. You are not exactly learning to operate, but you are finding out that a laparotomy on the human being is not usually a simple process, divorced from all danger; that few cases are uncomplicated; that no two cases are alike, and none exactly like the textbook description; that the finding of the parts, the severance of adhesions, the checking of hemorrhage, the protection of the awful and

mysterious abdominal cavity, often present almost insurmountable difficulties. You will also learn that while the abdominal cavity is the most dangerous place for the beginner to work, it is the most satisfactory place for one who has learned to understand and comprehend it.

UTERINE FIBROIDS WITH PYOSALPINX.

Our first case, on January 6, was Miss D., upon whom we performed abdominal hysterectomy, and almost scored a failure. There was a double pyosalpinx and development of uterine fibroids under the broad and sacro-uterine ligaments and against the bladder. The broad ligaments, even after the adhesions had been separated, were rigid and had to be ligated at the sides of the pelvis with the uterus *in situ*. The peritoneum had to be incised all around the growth before and behind the uterus, and the mass enucleated from the pelvic connective tissue in the face of profuse hemorrhage, which kept up even after an elastic ligature had been thrown around the cervix. After cutting off the tumors, which were the size of a large child's head, we ligated the stump, opened into the vagina between the cervix and bladder, and turned it down out of the peritoneal cavity. We then packed the bleeding pelvic connective tissue with a strip of iodoform gauze and brought the end out over the stump into the vagina so as to drain into that viscus. The peritoneal edges were then sewed together over the gauze so as to separate it from the peritoneal cavity. As a last and most essential act we flushed the pelvic and lower abdominal cavity with several quarts of hot water, which had been boiled, in order to remove the débris. In two days I removed the gauze by traction through the vagina, and the patient has recovered so as to be able to sit up now without a symptom referable to the abdominal cavity. The abdominal incision was open two hours, the quantity of blood lost was great, and the disorganization of the pelvic tissues most extensive.

What did we do to save the patient from the death that formerly accompanied such operations? We did many things that were formerly not done. We first protected the intestines by a flat sponge fixed to the peritoneal edges by hæmostatic forceps, and scarcely touched the intestines during the whole operation. We also sutured off the peritoneal cavity from the oozing surface. Then, instead of leaving this oozing connective tissue to take care of itself, we drained it by iodoform gauze brought out into the vagina. We also carefully avoided rubbing the epithelium from the intestines while sponging the blood from the pelvis. We used running water instead of rubbing sponges,

to remove shreds and clots. In other words, we observed that careful attention to detail that distinguishes the modern laparotomist from the older class of general surgeons.

OVARIAN TUMOR WITH UTERINE FIBROID.

The next case, Mrs. G., had an ovarian tumor on the left side, about the size of a fist, so firmly adherent in the pelvis that its enucleation tore the peritoneum from the sacro-uterine ligament and posterior surface of the broad ligament and caused considerable hemorrhage. The appendages on the right side were also firmly adherent. After separating these I lifted up the fundus uteri and found a pedunculated uterine fibroid the size of the thumb, and removed it.

A glass drainage-tube was put in the recto-uterine peritoneal pouch, or cul-de-sac, and made to project at the lower end of the incision. On this end was fitted a piece of rubber-dam, the same as is fitted by the dentist over a tooth that is to be filled. After draining out the blood by means of a small rubber-tube attached to a small glass piston-syringe, we passed a thin strip of iodoform gauze to the bottom, put some packing of gauze and absorbent cotton over the end of the tube, and folded the rubber carefully around. Over all this absorbent cotton dressings were placed. Thus the tube was quite perfectly protected from the entrance of germs. The fluid was drawn from the tube every hour until less than a drachm was found, then every two hours until the fluid either became amber-colored, or until the bloody discharge was reduced to a few drops, when the tube was taken out and the stitch tightened,—viz., at the end of thirty-six hours.

One fortunate thing we noticed in separating the adhesions was that the bleeding was all capillary and venous. The spermatic artery runs under the infundibulo-pelvic ligament, and is usually protected by it from injury. The only other artery that is liable to give trouble during such enucleation is the branch that runs under the Fallopian tube and which is protected by the tube. Arteries are found in the connective tissue of the sacro-uterine ligaments, but are so low as to be seldom torn. Right here, however, I must caution you that when omentum and intestines are adherent, new arteries are brought within the field of action, and we may not tear the parts asunder with such unconcern.

During the enucleation the cyst burst, an accident which in this case did no harm, but in case of a possible pyosalpinx should be carefully guarded against. Very old and firm adhesions usually tear into the softer tissues when being separated, whether the tissues involved be

the bowel, bladder, a pus-sac, or a cyst. In such cases we must enlarge our incision, bring the parts well into view, and separate the adherent surfaces either with a knife-handle, scissors, or knife-blade. The pedicle of the fibroid was, as you will remember, too short for ordinary ligaturing, so I tied it, then cut around it on the tumor about half an inch from the base and enucleated it from its severed capsule. I then took another turn with the ligature and left enough of the capsule to keep it from slipping off.

OVARIAN CYSTOMA DEVELOPED IN THE BROAD LIGAMENT.

The case just now operated upon, Mrs. Johanna S., gave us this ovarian multilocular cystoma of the broad ligament, containing three quarts of fluid. It was developed deep in the pelvis, between the layers of the broad ligament, and could not be drawn up to form a pedicle, yet was treated in a manner quite safe for the patient. We cut its peritoneal covering all around a few inches above the uterus and pelvic brim, and enucleated the inner secreting wall from its bed. The hemorrhage due to tearing of the veins of the broad ligament was controlled by sponge packing, while with catgut we stitched the sac that was left to the lower angle of the wound. This separated it from the peritoneal cavity, which had been protected by flat sponges, and had suffered no injury. We then removed the sponges, and packed the oozing tumor-bed full of iodoform gauze, with the ends brought out. The peritoneal cavity was then closed. From one-third to one-fourth of the packing will be removed each day, and the cavity will undoubtedly close rapidly around it without suppuration.

Thus you see each of these cases has presented difficulties of its own, yet our present advanced knowledge of peritoneal surgery has enabled us to successfully adapt our methods to each. In fact we are all learning to imitate Lawson Tait's successes. The secrets of abdominal surgery are fast becoming generally known.

GONORRHOEAL PYOSALPINX.

Both of these two patients have incurable diseases of the uterine appendages, due to gonorrhœal infection, one of recent origin and the other of many months' standing.

The patient now upon the table, Mrs. T., age thirty years, was infected by her husband ten weeks ago. Her temperature at each monthly period rises quite high, it having reached 104° F. at the last period, about ten days ago. Between the periods it ranges from 99° F. to 100° F. She sits up but little, and is not much benefited by

treatment. Behind the uterus, and extending laterally, is a hard, irregular, tender mass fixing the uterus in the pelvis. A mucopurulent discharge comes from the softened, deeply-colored cervix.

I make a median incision three inches long over the pubes, explore with two fingers, and find the pelvis full of solid tissue, with the uterus tipped back over and adherent to it. Getting the uterus partly separated, I find the right thickened tube and enlarged ovary adherent in the recto-uterine cul-de-sac. They finally come up into view, but the fimbriated extremity of the tube, which is soft and ecchymotic, has burst and lost its contents. The tube is the size of the thumb. In ligaturing I divide the thickened pedicle in two parts at the uterine horn, and draw the silk thread very tight before cutting off the diseased parts. I am also cauterizing the end of the tube left in the stump with strong carbolic acid, in order to avoid subsequent infection of the peritoneal cavity.

The left tube is long and thickened and makes a turn on itself so as to cling to the posterior surface of the uterus by its fimbriated extremity, a rare form of displacement. In liberating the enlarged ovary I have torn into the left broad ligament, but the oozing, although quite considerable, is only venous and capillary, and will be rapidly diminished by our sponge pressure. I ligate this side in the same way as the other, but am, as you see, attaching the stumps by fine silk threads to the peritoneum and muscle on either side of the lower end of the incision. This for a double purpose,—viz., prevention of a return of the retroversion and to keep the stumps within reach in case they should undergo septic changes. It adds greatly to the safety of the operation.

Now let us clean up. Through this funnel and rubber tube with its glass point, fully one-third of an inch in diameter, and carried down to the bottom of the pelvis, we will keep the nurse pouring pitcherful after pitcherful of hot water. It comes out in small torrents as clean as it goes in. But we must remember that the pelvic cavity is infected, and we must wash and wash until the last impalpable microbe has been carried away in the freshet. Having used several five gallon cans, I think we may stop and sew up. I shall leave this glass drainage-tube, however, as the patient's chances will be better by having the bloody serum, that must gather in the pelvis, drawn off.

Thus you see how rapidly may the gonorrhœal poison travel through the genital tract of women and dangerously disorganize the pelvic peritoneum.

The patient now being anæsthetized, Mrs. S., age twenty-two, is one

whom I have been treating for several months at my office for endometritis and a tumor-like mass, the size of a hen's egg, behind and to the right of the uterus. Moderate dilation of the cervix, with the application of mild disinfectants to the uterine cavity, such as a fifteen-per-cent. solution of ichthyol in glycerin or a weakened tincture of iodine, and glycerin wool tampons in the vagina, have helped her, but have not prevented occasional mild attacks of localized peritonitis. The history is one of an attack of pelvic inflammation following an acute vaginitis, about a year ago. Knowing that the condition is a septic one, I suspect gonorrhœa as a cause. The other chief cause of such a condition—puerperal septicæmia following childbirth or abortion—has been excluded.

Having opened the peritoneal cavity as in the other case, I come upon a soft mass, adherent, at the bottom of the pelvis, to the posterior surface of the right broad ligament. As the Fallopian tube loosens up I find it the size of a man's thumb. The ovary, which constitutes the remainder of the mass, shells out of its bed and comes up with the tube. Two or three little cysts have burst and some pus can be seen to be exuding from the open, but thickened and contracted, fimbriated end of the broad ligament. Now we have the explanation of the attacks of pelvic peritonitis. Whenever the pus in the tube could not discharge freely through the uterine end a few drops have been forced out of the fimbriated end upon the diseased ovary. The ovary has already become infected, and some of the cysts next to the tube contain pus.¹

I have carefully packed the pelvis with sponges to catch this pus, and as I cut off the diseased parts, I cauterize the stump with strong carbolic acid. The other ovary and tube are not thus affected, and as the patient has forbidden me to remove both ovaries, I merely puncture the cysts in the left ovary, inject a drop of tincture of iodine in each, and press out the excess. In about two months I will dilate the cervix, drain the uterus, and endeavor to entirely cure the endometritis, so that the other tube and ovary may not become infected. You see that while I am talking I am running gallons of water through the peritoneal cavity. Now, many men think that this flushing of the peritoneal cavity is but little short of murderous: they have lost some of their desperate cases and have made the clean water a scape-goat. My opinion is that we should only flush for cause, but when it comes

¹ Dr. F. B. Robinson, who examined the specimen, considered this pus to be gonorrhœal.

to choosing between abrading the intestinal peritoneum with sponges in imperfect attempts at the removal of tissue, débris, or septic material, and perfect water cleansing, give me a good, thorough, and adequate flushing. It is too little clean water rather than too much that is the bane of peritoneal surgery, whether it be used on the surgeon's hands or in the patient's abdomen. On one occasion in this clinic sterilized hot water was not at hand, and I chose to save my patient by washing out the whole abdomen with hot water from the hospital faucet, rather than let her die without it, for pus had entered. My openings were small, and I could not afterwards sponge out all of the residuum of the terrible faucet-water, yet my patient got well quicker than usual. There are many women now living whose lives I have saved by peritoneal flushing, and there are some under the sod who would have recovered had I washed out the peritoneal cavity with clean water.

TRAUMATIC (NON-SEPTIC) FEVER FOLLOWING LAPAROTOMY.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

BY M. D. MANN, A.M., M.D.,

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GENTLEMEN,—I have here the charts of three cases showing the pulse- and temperature-curves following laparotomy. The first was that of an old lady, aged seventy-three, who had a large ovarian tumor which had lasted a comparatively short time. I took it out through a small aperture; there were no adhesions and the case was absolutely uncomplicated. The temperature on the second evening rose to 100°, on the third evening to 100.2°; the next morning it fell to 99°, and it has never been above 99° since that time. It is now the twelfth day, and for the last four or five days the temperature has been normal. The pulse has never reached 100, and it is now in the seventies. It is quite a common occurrence to see a temperature-chart like this following laparotomy, and I consider it the normal outcome. Unfortunately, it is not universally the case, and sometimes we get complications which cause uneasiness and often a great deal of anxiety, but which nevertheless very frequently have a fortunate issue.

You remember a case that I showed you a couple of weeks ago; of a woman who had a parovarian cyst. Some of you saw the operation, which was very short, occupying only about twenty minutes. I found no pedicle, but the tumor was embedded in the broad ligament, and I was obliged to enucleate it from its nest, leaving a large oozing cavity. The patient was a strong, healthy woman, and she had little reaction. On the second day her temperature was 101.2°, on the next evening 101°. It then fell to 99°, and remained below 100° until the evening of the eighth day. Her pulse had been below 100, though it crept up a little on the seventh day. On the evening of the eighth day her temperature suddenly jumped up to 101° and her

pulse to 120. The next morning the temperature was down again to 98.5°, though the pulse remained rapid. I was a little anxious about her, for the pulse is always a better index to a patient's condition after laparotomy than the temperature. Some persons have a very mobile temperature, which goes up to a considerable degree on very slight provocation. This is particularly the case in children. The pulse is not so easily moved; therefore, when I find a temperature going up, but not the pulse, I do not feel so much alarm, as it may indicate a stitch-hole abscess or something of the kind. On the tenth day this patient's temperature was 103°, the pulse 140 and very weak; the tongue was dry and black, and she was delirious—she is only half-witted anyhow. Naturally I was very much alarmed about her condition. I made a local examination to see if I could find any cause for it. The stitches had been taken out of the abdominal wound, and the union was perfect except at one point. The patient had been very restless and had pulled off the dressings time and again, so that I should not have been at all surprised if there had been considerable suppuration around the wound. Although the nurses had pinned on the bandages in the most complicated way, she would take the pins out and tear off the dressings in spite of every precaution. I felt, however, that there was room for trouble in this large cavity which had been left in the broad ligament, since it might have taken on a septic process. Here was a large space surrounded by connective tissue, which is not nearly so good an absorbent surface as peritoneum, a certain amount of blood oozed into it and it was exposed to the air during the operation. It occurred to me that if this was the case the blood might have decomposed,—and I had seen it happen once in the practice of another physician,—and thus suppuration be set up in this broad ligament. I might tap the abscess through the vagina, wash out the cavity and possibly drain it, and thus save the woman's life. I made a careful bimanual vaginal examination, and by it I was able to make out that there was a large mass in the left broad ligament from which the tumor had been removed. The broad ligament was as hard as it could be. This, I thought, was a true cellulitis. You will read a good deal about cellulitis in the older text-books of gynecology, but I have not said a word to you about it in the didactic lectures this winter, because it is a very rare disease. I could not tell what the nature of this cellulitis was, whether it was going to result in an abscess, or whether it was a non-septic form of inflammation which would gradually subside and allow the patient to get well. I put the woman on stimulants, given freely, gave an antipyretic to bring down the temperature, and

watched the result. On the eleventh day the temperature was 102.5° , the pulse still 140. On the twelfth day there was a decided drop, and on the thirteenth day the temperature was normal and the pulse had fallen to 90. All anxiety was then relieved; I knew she had had a simple non-septic cellulitis at the site of the tumor, and that the chances were that she would get entirely well. Apparently she is going to, for her temperature is now a little subnormal, her pulse about 90, her tongue has cleared up, and every symptom is favorable.

I mention this case for the reason that such attacks after laparotomy are not very uncommon. They cause the operator and the friends of the patient a great deal of anxiety, but in the majority of cases they get well; unfortunately, we cannot always distinguish between these simple attacks and the severe attacks which end in death.

Let me relate to you another case. On the 22d of January I operated on a lady who gave a history of gonorrhœal infection. I found the tubes and ovaries buried in masses of adhesions, there being a salpingitis and perioöphoritis of both sides. I removed both tubes and ovaries; the one on the left side was the more adherent and I had the greater amount of trouble with it. This patient went along very nicely, reacting well from the shock of the operation. On the second day her temperature was only a little above 100° , on the third day it was down to 99° and her pulse was only 90, and everything seemed favorable. On the fifth day, however, the temperature rose to 101° , and on the seventh day it was 102.5° , and the pulse jumped up to 120. She did not seem to feel very badly; there was no tympanites nor vomiting, and apparently nothing very alarming about the case, and yet, with the pulse 120 and the temperature 102.5° , I could not help being anxious. On the eighth day her temperature went up to 103.6° and her pulse still remained at 120. She was given a dose of acetanilide, and two hours later her temperature dropped to 100° and the next day to 99° , and in the morning of the tenth day to normal, where it has been since, and her pulse has dropped gradually to 70. This woman had an attack somewhat similar to that of the last patient. There was a distinct bunch to be felt on the left side, and it was somewhat tender, but the actual condition was, I think, entirely different. The cellular tissue had not been opened into, and I think her trouble was entirely a peritonitis. The first of these cases was certainly non-specific, but in the second the inflammation may have been due to a local infection of the peritoneal cavity from the gonococcus in the tube. This explanation has lately been offered for these cases, and it seems to me very probable that there is some truth in the hypothesis.

These cases occurring after laparotomy are very trying indeed, and I speak of them in order that, if you have anything to do with laparotomy cases, you may not think that when the temperature and pulse go up on the fourth or sixth day after operation the case is going necessarily to end fatally. I do not know how to avoid this condition. It does not seem to be due to any error in the antiseptic management of the cases, because they do not end in suppuration. You may say, perhaps, that there is septic inflammation, and that the patient has the strength to withstand the onset of the germs and to overcome them, but there is no proof of this hypothesis, and I think that such cases are traumatic and not septic. I do not see why we may not have a traumatic inflammation here without sepsis, in the same way as in other parts of the body. For example, when a bone is broken, there follows a subcutaneous and non-septic inflammation.

EXTRA-UTERINE PREGNANCY.

CLINICAL LECTURE DELIVERED AT THE NEW YORK CANCER HOSPITAL.

BY HENRY C. COE, M.D., M.R.C.S.,

Professor of Gynæcology at the New York Polyclinic; Gynæcologist to the Cancer Hospital; Obstetric Surgeon to the Maternity Hospital; Obstetrician to the Infant Asylum; Assistant Surgeon to the Woman's Hospital in the State of New York.

GENTLEMEN,—The patient upon whom I shall operate this afternoon has an enlargement of the abdomen the exact nature of which, I frankly admit, is a matter of conjecture. Even the fact that several of my colleagues have pronounced the case one of ovarian cyst does not make me certain of that diagnosis, because the history has been so peculiar. It is easier to say what the tumor is not, than to say what it is. In view of the fact that it is increasing in size from week to week, and that the patient's health is gradually declining, an explorative incision is clearly indicated. Let us carefully review the history, as furnished to me by the attending physician, Dr. M. The woman is a multipara, aged thirty-eight, French by birth; has always had normal labors and no pelvic trouble, as far as can be ascertained. Dr. M. saw her for the first time September 22, 1892, when she told him that she had menstruated in April, had skipped the May period, and June 20 had labor-pains with flooding, which continued for twelve days. She passed a number of large clots, and naturally supposed that she had aborted. She had no more flow up to the time when the doctor first examined her. She then had morning sickness, with tenderness of the breasts. On examination a median tumor was found extending midway to the umbilicus, and continuous with the cervix uteri, which was softened. Hegar's sign was well marked, and intermittent uterine contractions could apparently be felt. The diagnosis of pregnancy at four months was made, and a few days later the patient affirmed that she felt quickening. On November 5, six weeks later, she was seized with severe pain in the right inguinal region, with uterine hemorrhage, for which no cause could be assigned. The flow continued for several days, but

there were no labor-pains. During the next two weeks she had an attack of peritonitis, localized on the right side, with a rapid pulse but low temperature (not exceeding 100° F.). At no time did she show evidences of internal hemorrhage. She made a good recovery, and was soon about her work, and free from pain. Meantime the tumor continued to enlarge, corresponding in size with the supposed period of gestation, and the patient insisted that she felt life. The doctor entertained no doubt regarding the existence of normal pregnancy, although at repeated examinations he was unable to detect either the foetal heart or movements, and internal ballottement could not be obtained. The uterus seemed to be unusually thin-walled, but the foetal parts could be felt by external palpation. The confinement was predicted at the end of February. As Dr. M. was not engaged to attend her, he did not see her again until he was called in April, when he was surprised to find that she was still undelivered. I then saw her with him. She was in good condition, and declared that she felt life. Her breasts were flabby; the abdomen presented the ordinary appearance of a woman at full term, the enlargement being absolutely symmetrical. I was sure that I could map out a thin-walled uterus, containing an excess of amniotic fluid, in which floated a small foetus. The foetal parts were not at all distinct, but were undoubted. The most careful auscultation failed to reveal either foetal heart-beat or movements. A vaginal examination convinced me that the tumor was uterine. The diagnosis seemed to be plain,—hydramnios, with a small foetus, the latter probably dead. I recalled in this connection a similar case of hydramnios, in which I had been summoned to operate for supposed abdominal pregnancy and delivered a dead foetus *per vias naturales*. The only difference was that in the latter case the foetal parts were felt with startling distinctness. I heard nothing more from the patient until last week, when, to my surprise, her physician informed me that she had not been delivered, although three months had elapsed since the date first set. Meantime, the tumor had increased in size, and fluctuation was so distinct that he believed that the condition was either ovarian cyst or abdominal pregnancy. I admitted her to the hospital, and found that she had grown considerably emaciated, and that there was a marked increase in the size of the abdomen, the veins being unusually distinct, as we sometimes see in cancer of the liver. She was examined by several of my colleagues, who were confident that she had an ovarian cyst, possibly malignant. I leaned strongly to this diagnosis, but was puzzled by the fact that I had previously felt supposed foetal parts *within a sac*—a sign which I had never known to

fail in a doubtful case. The only bodies which could simulate them would have been cancerous nodules, or subperitoneal fibroids with ascites, or secondary cysts on the surface of a large, thin-walled cystoma, which were excluded at the time of my first examination in April. In order to gain some additional light, the patient was thoroughly examined under ether. Again it was evident that the fluid was enclosed in a thin-walled sac, within which could still be felt a little body, bobbing up and down at every impact of the finger, just like a foetal head. There was absolute dulness over the surface of the tumor (which now extended up beneath the ribs, displacing the viscera), with tympanitic resonance in the flanks; there was no variation with change in the patient's position. On examination per vaginam the cervix still appeared to be continuous with the tumor, but a sound could be introduced only three and one-half inches. The posterior fornix bulged downward, and distinct fluctuation was obtained, the wave being transmitted on palpating the abdomen. It now seemed probable that the patient was not pregnant at all, but had a thin-walled cyst.

You will appreciate the feeling of uncertainty with which I approach the operation, since I am not sure what I shall find. Still, I am prepared to encounter anything,—an ovarian cyst, cancerous ascites, or extra-uterine (but I trust not uterine) pregnancy. On account of the extreme thinness of the abdominal wall, the incision is made with some care, in order not to open the peritoneum unexpectedly. There seems to be nothing but fascia between the latter and the skin. The peritoneum is evidently much thickened, and bulges out into the wound, showing the presence of free fluid behind it. On making a small nick there is an escape of black, grumous fluid, which I shall draw off through a trocar [four or five quarts were removed] before exploring. It certainly does not resemble either ascitic or cyst fluid. On introducing my finger, I enter, not the abdominal cavity, but a sac completely shut off from it, and at once feel the hand of a child! The uterus is felt far down in front of the sac, which dips down into Douglas's pouch and extends upward so as to lie in contact with the liver and stomach. The doctor was right in his inference. The wall of the sac is so thick that my first impression was that I had entered the uterine cavity. The child and placenta are fully developed, but the foetus has evidently been dead for a long time. [It measured eighteen inches and weighed six and a quarter pounds.] As the placenta is bloodless, I am able to detach and remove it at once. Nature, by shutting off the sac through firm adhesions, has clearly indicated the course to be pursued,—to let it absolutely alone and allow it to drain freely

and close by granulation. After irrigating it thoroughly with warm Thiersch's solution, I introduce a long drainage-tube to the most dependent part of the sac, behind the uterus, and pack in as much iodoform gauze as it will hold. An opening at least three inches in diameter is left, the patency of which is still further secured by stitching the edge of the sac to the edge of the external wound. There is no reason why this patient should not do well, as it has been impossible for the general peritoneal cavity to become infected. The healing process may be a slow one, but it will be much more rapid than it would have been had we been obliged to leave the placenta to come away later.

[The patient became septic during the first week of convalescence, as the drainage was not good. This was obviated by making a large counter-opening in the vagina, after which she began to improve rapidly. Four weeks after the operation she was out of bed, the sac having contracted until its capacity was not over three or four ounces.]

RETROVERSION OF THE UNIMPREGNATED UTERUS.

CLINICAL LECTURE DELIVERED AT THE COLLEGE OF PHYSICIANS AND SURGEONS
OF CHICAGO.

BY A. REEVES JACKSON, M.D.,¹

Professor of Gynecology in the College of Physicians and Surgeons of Chicago.

GENTLEMEN,—This patient has a displacement of the uterus. Such a statement seems very meagre nowadays, and yet but little more than half a century ago it would have been deemed almost sufficient for both diagnostic and therapeutic purposes. In those old days of gynecological simplicity the term displacement was about equivalent to "falling of the womb," for while it was even then known that the organ might be tilted forward or backward, it was considered to be in need of attention only when it had moved unduly downward. Not only was the dislocation regarded as a simple matter, but also its etiology, pathology, and treatment were considered unimportant. Overdistention of the vagina during labor, with or without a torn perineum, was considered the chief, if not the only, causative condition. The want of support below, and the relaxation and weakness of the supporting structures above, were thought to be quite sufficient to account for all the phenomena which were observed. There was but a single principle involved in the treatment; this consisted in the furnishing of artificial support to the prolapsed organ from below. The womb was pushed into the upper part of the vagina, and held there, as a rule, by filling the vagina with a wad of tow or cotton saturated with some astringent fluid. Sometimes a piece of sponge was used. Pessaries were likewise employed for this purpose. They were composed of wood, glass, metal, or a disk covered with beeswax. These instruments were even more various in shape than in substance. Frequently, a practitioner living in the country, who met with a patient suffering from prolapsus, would send to a neighboring city for "a pessary," usually without desig-

¹ Since deceased.

nating the kind, form, or size. If it did not fit the case when it came to hand, so much the worse for the woman.

All this has been changed. Practically as well as theoretically it is now commonly understood that the uterus may be displaced in every conceivable direction and degree, that the causation and pathology are frequently complex, and that the treatment in many cases demands the highest degree of gynecological skill.

The uterus, as you know, is normally a movable organ. The structures to which it is attached permit a limited degree of movement in every direction, so that, strictly speaking, there is no one normal position a departure from which constitutes a pathological displacement. On the contrary, one of the essential features of a uterine displacement is a lessening or absence of its natural mobility. A very full bladder may force the normal uterus into a state of extreme retroversion; and a greatly-distended rectum (although this is more rare) may compel it to assume an unusual degree of anteversion. These temporary aberrations of position are not, however, of pathological importance, and I only mention them in passing. But if the organ be so anchored forward or backward as to be unable to yield to these and similar influences, it is said to be anteverted or retroverted. Hence you will perceive that it is the permanency rather than the degree of the displacement which is of importance. Moreover, the mere error of position is not of so great consequence as the conditions which have led to it and which may accompany and perpetuate it. It is now generally believed that even as concerns the uterus itself the changes which take place in its substance, whether precedent to or in consequence of its malposition, are more accountable for its resulting symptoms than is the abnormal deviation of location.

I have told you, on a former occasion, that there are certain subjective symptoms in women which may always be accepted as indications for making a pelvic examination. Among these are pelvic or dorsal pain, a sensation of weight, fulness, or pressure in the pelvis, persistent derangement of function of any of the pelvic organs, unusual discharges from the genitals, whether bloody, mucous, purulent, or serous. These symptoms are never sufficient of themselves to determine a diagnosis or to enable you to institute rational treatment. Their presence, nevertheless, is full of meaning and implies an invitation to a thorough investigation,—an invitation which no conscientious physician can possibly decline to accept. Indeed, to do so would be evidence of inexcusable carelessness. Errors in diagnosis frequently result, doubtless, from the inherent difficulties of the subject, but far oftener they come

from the failure on the part of the examiner to use diligently all available means of investigation. Some of these guiding symptoms which I have named were present in the case of this patient and led to the knowledge of her condition. Here is her history :

She is thirty years old. She commenced menstruating at the age of fourteen, the function having always been regularly performed and, until the last two years, without a noticeable degree of pain. She married at the age of twenty, and has had three living children, the younger being now four years old. This was not her last pregnancy, however, for two years ago she had an artificially-induced miscarriage when she was three and a half months pregnant. This event seems to have been the starting-point of her present impaired health. An attack of pelvic inflammation, with high fever, followed the expulsion of the fœtus, and the patient was confined to bed more than two months. She has been an invalid ever since. Her symptoms have included a sensation of dragging or pulling in the lower pelvis, frequent micturition, obstinate constipation, an abundant yellowish, glairy leucorrhœa, and latterly menstruation has been rather profuse and accompanied by pain.

I made a very hasty digital examination of the vagina in the ante-room a few minutes ago, and that examination it is now my purpose to repeat and extend.

The waist-dressing of the patient has been thoroughly loosened, and she has just emptied the bladder. As she lies upon the back with the knees separated and drawn up, I introduce two fingers into the vagina, and at the same time make downward and backward pressure with the disengaged hand applied to the hypogastrium. In the endeavor to bring the two hands together, I should be able, if the uterus were in normal position, to feel the fundus of the organ behind the pubic bone; but it is not there. More than this, I find the os uteri, which should be directed approximately towards the coccyx, pointing forward. Moving the vaginal fingers backward, I feel a concavity at and extending somewhat beyond the utero-vaginal junction, and still farther onward is a smooth roundish swelling occupying a position at a lower level than the os uteri; this is the body of the uterus. I need not tell you at this time of the process of reasoning by which I have eliminated other conditions which produce swellings behind the posterior vaginal wall, such as a prolapsed ovary, impacted fœces, inflammatory exudation, or a fibroid of the posterior wall of the uterus. The methods of differentiation between these and similar disorders I have spoken of before, and when you become accustomed to making

pelvic examinations you will possibly be surprised to discover how promptly you may sometimes be able to complete the diagnosis. I say sometimes, because occasionally there are found such complications in the pelvis as puzzle the most experienced surgeons, and this, too, even after the parts are exposed to sight and touch by a laparotomy. Your rule of conduct under embarrassing circumstances of this character is a simple one: keep in remembrance the conditions which may be found, then check them off mentally as you go through the list until the docket is cleared. You will at last arrive, by exclusion, at the most important one.

There are no puzzling conditions here so far as regards the diagnosis. The patient has a backward displacement of the uterus, and the dislocated organ is also retroflexed. This conclusion is readily reached, but in order to determine the proper treatment our investigation must extend somewhat further. While I have been talking my fingers have not been idle; and, as you may have noticed, from the occasional shrinking and exclamations of the patient, what I have been doing has given rise to some pain. In cases such as this the fundus of the uterus is usually quite tender, and even very slight pressure against it occasions suffering. And indeed I have been making a very considerable degree of pressure. I have been trying to elevate the uterus from its bed in the hollow of the sacrum, to which it has no right, by pushing it upward gently but steadily. This manœuvre caused pain, but did not accomplish what I desired. I then endeavored to push the cervix downward and backward, in the hope of tilting the fundus upward by the leverage thus exerted. This did not cause so much pain, but was equally unsuccessful. My motive in doing all this has been to settle a most important point,—namely, the possibility of replacing the uterus.

The two essential factors in the cure of such a displacement are, first, the restoration of the organ to the normal position, and, secondly, its maintenance there. Obviously, these objects must be accomplished in the order named, and success must attend both of them, or treatment will fail. Hence the importance of what I have been trying to do. But manipulation alone is unsuccessful, and I must invoke other aid. There are two methods yet at my disposal. One of these is manipulative, and the other instrumental. The former being the safer, I shall essay it first.

For this purpose I must alter the position of the patient. I shall place her in the knee-chest posture. She will rest with her knees upon the table, and elevate the hips as high as possible by having her thighs

in a vertical position. She will then lower the chest and place one side of her head upon the table. This postural preparation being completed, I again introduce two fingers of one hand into the vagina, and slightly separate them. Immediately there rushes into the canal a column of atmospheric air, widely distending the vagina and tending to dislodge the uterus from its false position. This result is further aided by the action of gravity in causing the abdominal contents to move towards the diaphragm. These forces alone will sometimes prove sufficient to start the truant and carry it upward. But they are not enough here; so I shall now renew my finger-pressure through the vaginal wall, and if it again fails I will likewise invade the rectum with one or two fingers of the other hand. By this latter route we approach nearer to the fundus by about three-quarters of an inch, and gain consequently in the degree of force which we may desire to use. But I am glad to discover this is going to be needless. Already the fundus is rising, and as it does so the os uteri is moving backward. The uterus is replaced.

If pressure and pneumatic forces had not succeeded, I should have used the instrument to which I have alluded,—the uterine sound; for although this instrument has fallen under the ban of the gynaecological iconoclast,—for insufficient reasons, in my judgment,—I find it extremely serviceable in selected cases for certain purposes. The abuses of the instrument should not be brought forward as arguments against its proper use. As well might we abolish the obstetric forceps, or the scalpel, or the use of drugs, because they may become harmful agencies. Learn to use rationally all helpful appliances in their proper places, and you will not need to lay them aside except to replace them by better ones.

The uterus is now in fairly good position, and it will remain so as long as I keep the cervix pressed backward and the patient continues to occupy this posture,—both conditions clearly impracticable. But if I should remove my fingers, and the patient should turn again upon her back, I do not doubt that the fundus would at once fall back against the rectum and resume its close and mischievous relations with that viscus. Then, too, the flexed condition of the uterus, although this feature of the case is of only moderate degree, may be sufficient to militate against great simplicity of treatment.

In any given case of combined retroflexion and retroversion of the uterus there must always be some doubt concerning priority. But if the patient be a woman who has borne children, the probabilities are that the version occurred first and the bending subsequently. The

sequence of events is usually as follows : During the stage of involution, and while the uterus is heavy, the woman, in accordance with a time-honored custom, is kept on her back in bed. Lest the uterus may not, from its increased weight, sufficiently descend into the hollow of the sacrum, it is forced there by an absurd compressing abdominal bandage, tightly pinned by a strong-armed nurse, who sometimes adds to the mischief-making procedure by folding a towel and placing it against the hypogastrium. Under these circumstances *the uterus must become retroverted*. The upper part of the helpless organ, being heavier than the lower, sinks deeper, and, it being unrestrained by the supporting structures, which are attached only to the cervix, bending soon ensues at the junction of the cervix with the body. This result is made more certain and occurs more quickly because as soon as the uterus topples at all backward the pressure of the abdominal contents comes upon its anterior wall, and this continuous force is aided by efforts at stool, lifting, coughing, sneezing, etc.

Now, what is the practical teaching from these considerations? It is this : If we can maintain the fundus in a position forward of the perpendicular axial line, these forces will be reversed in their action and will be expended upon the posterior wall, as they should be ; and the habitual leaning forward of the fundus will tend to remove the kink from the posterior wall and by and by may efface it entirely.

How shall we keep the womb in proper place? During the past few years pessaries have been used chiefly for this purpose in all available instances, and in the case of this patient I find the two necessary conditions for successful pessary treatment,—namely, mobility of the uterus and a sufficiently firm perineum. If I had found the uterus adherent to the structures adjacent to it in its malposition, a pessary would have been injurious. It not only would have done no good, but would have done harm. The proper function of such an instrument—and I want to emphasize the statement—is to keep the organ in position, not to put it there. Again, an intra-uterine pessary cannot be used efficiently unless there be sufficient firmness and completeness of the structures about the vaginal outlet to prevent the instrument from falling out. Let me say here that you can hardly acquire more useful gynecological knowledge than is involved in the study of pessaries in their relation to uterine displacements. The latter are found with great frequency, and must comprise a very large proportion of your gynecological cases. The measure of your success in their management will reflect your knowledge of their mechanism and the mechanical capabilities of the pessary. Certainly there is nothing brilliant about

such practice: it is simply useful. But if you are conscientious, and prefer benefiting your patients to heralding your wonderful surgical performances in medical societies and journals, here is an ample field for you.

I have here, as you may see, an assortment of pessaries varying greatly in size and shape. They are nearly all composed of vulcanite, a substance which has many desirable qualities for this purpose. It is light, not fragile, susceptible of a high polish, and wholly impervious to moisture. Besides, by covering its surface with oil and holding it in the flame of an alcohol lamp, or dipping it for a few moments in very hot water, it may be moulded into any desired shape, which it retains on cooling. I have, however, also a few which are made of soft rubber with an embedded copper wire to give them some stiffening, the shape of which may be changed somewhat merely by pressure with the fingers. They are sometimes temporarily convenient and useful until you have learned just what your patient needs. But they are objectionable for permanent use because of their capacity for absorbing the vaginal discharges, which render them offensive and irritating. When you have ascertained the exact shape and size of the needed instrument, it is better that it should be of hard rubber.

Basing my selection upon the impression which I have of the size and conformation of the vagina, I have picked out two or three of the vulcanite instruments, and will try the smaller of them first, for it is a distinct advantage to use the smallest that can be effective. While a large-sized pessary may equally, and sometimes more promptly, maintain the uterus in proper position, it should never do this simply by reason of its size, if we hope at all for ultimate success; because such an instrument, by constantly keeping the vaginal walls stretched, must cause a degree of over-distention which conduces to a perpetuation of the original trouble; also it invites their protrusion, and the formation of the conditions known as rectocele and vesicocoele. A judiciously-placed pessary must act rather by its form than by its size. It must not push up the fundus,—indeed, it cannot do this after proper replacement,—but must keep it forward by drawing the cervix backward. It does this by means of the large upper curve which pulls upon the utero-vaginal junction. But in doing this it should not deprive the uterus of its mobility; it should only lessen it. It should only prevent it from moving in the wrong direction. Now, seizing the lower or smaller end of the instrument with the thumb and fingers of the right hand, I introduce two fingers of the left hand as a guide. Never attempt to place a pessary without this preliminary; otherwise you will almost

inevitably cause unnecessary pain. The upper portion of the instrument is now passed into the vagina, the needed degree of pressure having been exerted against the palmar surface of the fingers. Next I tuck the upper end behind the cervix. As I withdraw the fingers I pass one of them around the pessary in order to assure myself that it cannot exert any injurious pressure. The fit seems sufficiently perfect, and the operation is completed.

The patient will use the instrument for a period of from three to six months, but not continuously. She will be instructed how to remove and insert it herself, and she should promptly take it out at any time in the event of its causing pain; even should it occasion no discomfort, it is proper to remove, cleanse, and replace it after each menstrual period. Unless the patient be able to do this herself, she will very likely neglect going to the physician for the purpose of having it done, and serious results may ensue. As examples of such possible mischief, I may mention that long-worn, neglected pessaries have found their way through the vaginal septum into the bladder and rectum, and once I detected one in the act of getting into Douglas's cul-de-sac through an opening which was already large enough to admit the forefinger. Of course, in these cases the untoward results arise from the instrument being injudiciously selected and improperly fitted; but even in the case of fairly well adapted pessaries there may be unequal pressure at some point, ultimately causing ulceration. The rule, then, to remove and cleanse them occasionally, and to watch the condition of the cervix and vaginal walls, should be imperative.

In cases in which the pessary fails to afford sufficient relief, or in which it is inapplicable for any reason, other measures may be used.

Thus, if the uterus be movable and can be replaced, the procedure known as Alexander's operation—shortening the round ligaments through an external incision—may be performed. In other instances in which the uterus is bound down in malposition by adhesion, and to which neither a pessary nor Alexander's method is suitable, and where the symptoms are sufficiently grave to justify it, the abdomen may be opened, and the uterus, being freed from its false attachments, may be stitched to the abdominal wall above the bladder. In a limited number of cases these graver surgical procedures are of undoubted propriety and benefit.

**PALPATION OF NORMAL OVARIES—CHRONIC SAL-
PINGITIS—MENSTRUATION AFTER OÖPHO-
RECTOMY—DIAGNOSIS OF GONORRHŒA
IN THE FEMALE.**

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

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PALPATION OF NORMAL OVARIES.

GENTLEMEN,—CASE I.—This woman is twenty-seven years of age, and has had four children and two miscarriages. The last child was born about fourteen months ago, and she is still nursing it. She complains of pain on both sides of the abdomen, which has existed since the birth of her last child. She has not been unwell since her confinement.

Patients will often come complaining of pain in the abdomen and on examination no obvious cause for the pain can be found. This patient's uterus is very freely movable, and both ovaries are normal. I see many cases in my office in which I find nothing wrong with the pelvic organs. Such cases are usually subjects of neurasthenia,—nervous women, who come complaining of pain in the coccyx or between the shoulder-blades, or of occipital headache, of intercostal neuralgia, or of pain in the left hypochondrium or left iliac region, a little above the ovarian region. They naturally think that their pains must be of ovarian or uterine origin. These cases are much more difficult to cure than where there is something more tangible, as, for instance, a pelvic peritonitis or a displacement. In order to be able to exclude ovarian disease it is, of course, necessary that one should be competent to determine the condition of the ovary by palpation. The ovary, like the testicle, comes down extra-peritoneally, descending between the two layers of the broad ligament, and projecting through the posterior layer of this ligament. A small portion is extra-peritoneal, and this explains

how the majority of ovarian tumors growing upward towards the peritoneal cavity are not covered by peritoneum. It is only when the tumor grows downward between the layers of the broad ligament and dissects it off from its parietal attachments that an ovarian tumor is covered by peritoneum. To feel the normal ovaries, you must remember that the ovary, when in the normal position, can usually be grasped by pressing the outer hand upon the abdomen, and, beginning at the posterior brim of the pelvis, pushing downward and forward. If you begin at the anterior brim of the pelvis, you will push the ovary away from you. In this way you can usually grasp the ovary and ascertain its size, position, and consistency; and as you roll it about, the patient will generally show that the pressure causes pain. It is not very many years since the possibility of feeling the normal ovaries was recognized. Twenty years ago, while I was in Vienna, Leopold (now professor in Dresden) and myself began systematically to palpate the normal ovaries. We found that in the majority of cases we could palpate the normal ovary when in its normal position. Of course, if the ovary be somewhat enlarged, it will drop towards the pelvic floor, deeper on the left side, because Douglas's pouch is deeper anatomically on that side, owing to the position of the rectum. Hence under such circumstances it is much more easily felt. Sometimes the ovaries cannot be felt at all, because they drop against the posterior wall of the pelvis, just as in the case before us. The chances are that if I allowed this patient to stand up a moment I could then feel the ovaries. If the ovaries are prolapsed and attached to the bottom of Douglas's cul-de-sac or to its anterior wall, they can easily be felt, and you can often distinguish between the ovaries and the tubes. In many cases where there are adhesions, it is impossible, even when the finger is passed into the abdominal cavity during a laparotomy, to differentiate between the ovaries and the tubes. If we could feel the ovary in cases of cysts of the broad ligament, it would be very useful, but in such cases the ovaries are pushed out of reach by the tumor. When there is pain in the ovarian region, it is well also to endeavor to determine the exact condition of the ovaries.

CHRONIC SALPINGITIS.

CASE II.—Our next patient is twenty-nine years old, has been married eight years, and has had four children, the last one seven months ago. She is nursing. She complains of pain on the right side of the abdomen, is constipated, and has a profuse white vaginal discharge.

On examination I find it very easy to reach a mass on both sides,

but chiefly on the right; it is movable and somewhat larger than the normal ovary, and is abnormally tender. The mobility of the uterus is not noticeably changed, and hence we can exclude an acute adhesive peritonitis. The existence of a subacute oöphoritis and salpingitis accounts for this patient's pain. The diagnosis having been made by bimanual palpation, the question arises as to the significance of this condition,—a chronic inflammation of the ovaries and tubes, which means that the ovaries are somewhat enlarged and tender and that there has probably been some hyperplasia of the interfollicular elements. The tubes are probably in a condition of catarrhal inflammation with a certain amount of tumefaction. In older cases there will be, in addition to this swelling, an actual hyperplasia of the walls of the tube, so that it is not uncommon to see tubes about the size of the finger at the time of their removal. This is called pachysalpingitis, just as we speak of pachymeningitis when there is a thickening of the membranes of the brain by a chronic inflammatory process. This condition is significant, in the first place, on account of the great pain that it produces. There is, in addition to this, absolute sterility. No matter how much diseased the ovaries and tubes may be, if the tubes be permeable to the spermatozoa and ova, the woman may become pregnant.

Within the last few years I have seen a woman, brought to me by my partner, Dr. Wells, in whom both Fallopian tubes were as large as sausages, and yet she has miscarried two or three times since that examination. Probably there is at intervals a gush of fluid, the tube is emptied, and soon after that time conception takes place. As a rule, however, where there has been adhesive inflammation with consequent destruction of the tubes, the woman is sterile, but it is impossible to tell exactly at what period sterility may begin. It is proper, therefore, as long as the woman is not suffering extremely, not to remove the tubes. The older the case the more unsatisfactory is the treatment. It consists in the use of counter-irritation in the vagina as near as possible to the diseased ovary, with equal parts of tincture of iodine and glycerin. It is applied two or three times a week thoroughly, by swabbing out the vaginal vault, and followed by the insertion of a glycerin tampon, which is to be removed the next day. Hot douches, warm salt-water sitz-baths, iodine, or blisters externally over the ovarian regions, are also valuable aids to this treatment. For the pain use the positive pole of the galvanic current, a sponge or metal electrode covered with absorbent cotton placed in the vagina close to the sensitive ovary, and the circuit completed by a sponge connected with the negative pole applied over the abdomen. The current should never be

strong enough to cause pain, for it is used as a sedative and not as an irritant. In any case, even though of recent origin, the treatment will probably extend over a number of months before improvement will manifest itself. Where there are adhesions, you will probably never be able to detach them and restore the ovaries to their normal condition: yet I have seen much benefit from the persistent use of such measures as have been mentioned, particularly the iodine to the vagina. I am aware that many may think I am making too much of these remedies, but I am positive about the beneficial results so obtained. I should always use them when the symptoms are not sufficiently severe to warrant the removal of the appendages. These measures markedly relieve the pain and bearing-down, at least for a time. I do not, of course, mean that where the tubes are much enlarged, or the ovaries cystic, or where there are recurrent attacks of peritonitis every two or three months, this treatment is applicable, for such cases will ultimately require operative interference.

MENSTRUATION AFTER OÖPHORECTOMY.

CASE III.—This girl, by occupation a cook, comes to us on account of recurrent attacks of severe pelvic pain which prevent her from working. I operated upon her two years ago for a tumor of the right ovary, the pedicle of which was twisted four times. The tumor was so rotten that it was necessary for me to place my hand underneath it and lift it out. She comes to us now complaining of great and constant pain on the left side, and of pain on the right side only during menstruation. The uterus is slightly retroverted, and the ovary is absent on the right side, but on the left the ovary is felt to be somewhat prolapsed and slightly enlarged. It does not seem to be sufficiently abnormal to account for her pain; but although the girl is unmarried, she is evidently not a virgin, and it is possible that her habits involve too frequent sexual intercourse, and that this may have something to do with causing her pain. It is said that she menstruates profusely for ten days at a time. I do not believe this has anything to do with the condition of her ovary and uterus; for it is a common observation in my experience that cooks are liable to profuse menstruation as a result of the constant exposure to heat and the consequent pelvic congestion.

DIAGNOSIS OF GONORRHOEA IN THE FEMALE.

CASE IV.—The next patient wishes to know whether she has gonorrhœa. You notice that I told her immediately upon examination that I knew she had had pain on the right side for a long time, and I

said this, because there is a thickening of the broad ligament and a binding down of the ovary on that side. Now, as to the diagnosis of gonorrhœa, I cannot reply to this patient's question, and you should be very careful about giving a positive opinion in these cases. Avoid answering that question directly, except in cases where the result of the gonorrhœal infection is demonstrated in an individual of the other sex. The only other way in which you might directly answer the question—and there is some doubt about this in my own mind—is by a microscopical examination for the gonococci. The mere presence of an acrid, pungent, irritating, and more or less offensive discharge of a greenish, yellowish, or serous character is by no means a positive sign of gonorrhœa. I might, by carelessly answering this question in the affirmative, find myself a defendant in a suit on the ground of defamation of character. You have a perfect right to make such a diagnosis privately by taking into consideration the patient's habits of life, and similar matters, but you should be careful how you express that belief. In this patient, the uterus, and particularly the cervix, is enlarged and hyperplastic; it is one of those rather rare cases of hyperplasia limited almost entirely to the cervix, and the condition is usually due to a laceration of the cervix. In this case, however, there is no such laceration, and I presume here it is the result of too frequent irritation of the cervix from coition. As she has not had a child for eleven years, there is no other immediate reason for this enlargement of the cervix. The frequent congestion of the organ, particularly if it be followed by a catarrhal condition of its mucous membrane, is quite likely to cause such a hyperplasia. There is no evidence at present of gonorrhœa; the vaginal orifice does not seem eroded, and there is no more discharge than would be found in many a normal case. If a woman came to me with doubtful antecedents, with tenderness in the ovarian regions, with the tubes enlarged, and suffering at the same time from an irritating endometritis, I should feel that in all probability a remote gonorrhœal infection had started this endometritis and salpingitis; but I have seen several extremely bad cases of this kind in undoubted virgins.

I shall direct that this patient be treated by the external and internal application of tincture of iodine, glycerin tampons, and hot douches.

Ophthalmology.

I. TRACHOMA; HEMORRHAGE INTO THE RETINA IN BRIGHT'S DISEASE, AND FROM OTHER CAUSES. II. TRACHOMA; TREATMENT BY EXPRESSION; ENTROPION; INJURY OF EYE; REMARKS ON SYMPATHETIC OPHTHALMIA.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

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GENTLEMEN,—I have often told you that it was easy to make a mistake between chronic conditions of the conjunctiva and true trachoma, but in this boy I show you true chronic trachoma. You notice the thickening and swelling in the bottom of the cul-de-sac and certain elevations of the conjunctiva associated with a pale, swollen, granular condition in the angle of the eye. In touching these eyes with sulphate of copper, I attach a great deal of importance to the crystal being perfectly smooth. Those sticks which are made in moulds are very nice, except that they are too thick to admit of their being carried between the lid and the eyeball so as to make a thorough application to the whole reflection fold. You will notice that some of my colleagues touch the eye with blue-stone, and then allow the patients to depart without washing out the eyes; but this I regard as an infliction of unnecessary suffering, and it does not at all enhance the result. My object in employing this treatment is not to produce an eschar, but simply to secure an astringent effect. The application should always be made with a light hand.

This man is fifty-eight years of age, and a miner by occupation. About fourteen months ago he noticed that vision in both eyes was failing, particularly in the right eye. You know that if you irritate a nerve of special sense, the result is not pain, but an excitement of

the special function of that nerve. Thus, when the acoustic nerve is irritated, the patient complains of subjective noises ; if the gustatory nerve be irritated, the sense of taste may be aroused ; and when the optic nerve is irritated, flashes of light may be visible to the patient. Now, this man tells us that he first noticed loss of vision in the right eye, and that this was accompanied by some pain over the eyebrow, and that he saw flashes of light when in the dark, and also that there appeared a dark object before the eye. The symptoms are not such as to indicate the occurrence of an acute disease, which is usually accompanied by some degree of pain. With a history like this, you may be almost certain that there is disease of the fundus, and there is *a priori* evidence that the disease is in the retina, or in the choroid in such a way as to affect the innermost layers of the retina,—the rods and cones.

It will be interesting now to ascertain if this patient has any constitutional symptoms, for those which he has given us so far are not sufficient to lead such a man to seek medical advice. On inquiry, he tells us that seven years ago he was taken sick with vomiting and purging, and that for three months after this he was constantly troubled with vertigo. Nevertheless, he continued at his work in the mines, exposed to wet and cold. There has been occasional swelling of the feet, and some œdema under the eyes. When he came to me last August I examined his eyes, although at that time he was but little apprehensive of his general health. I found a considerable deterioration of his sight ; the right eye, which has always been the worst, had only $\frac{20}{200}$ vision, and the left eye $\frac{20}{100}$. On examining with the ophthalmoscope, I found a very deep physiological excavation of both optic nerves ; and although I now state this condition to be physiological, I was puzzled about it for some time, as I suspected it might be due to glaucoma. A careful study of his visual fields has led me, however, to exclude this. Examination of the retina showed isolated hemorrhages, which were especially marked in the left eye. Both eyes were the seat of considerable venous hyperæmia ; the hemorrhages were small and from the retinal veins. Some of them were in the immediate vicinity of the macula. This accounted for his very bad sight. Dr. Heineman found that the patient had chronic interstitial nephritis, and that albumin and casts were present in his urine. A few weeks ago the patient was found to be passing fifty-four ounces of urine in the twenty-four hours. I expressed to him my belief that the best treatment for his sight was that directed to the constitutional disease. He was placed by Dr. Heineman upon an exclusive milk diet as long as he would tolerate this,—about three weeks,—and he was given internally the

bichloride of mercury. His general condition has improved very decidedly, and the last time I examined him I found there was marked improvement also in his sight.

On testing his vision now, we find that it is $\frac{20}{200}$ in the right eye and $\frac{20}{40}$ in the left. I am very anxious that you should all be able to see the hemorrhages in his eye of which I have been speaking. As you examine him with the ophthalmoscope, you will see, in the left eye, that the hemorrhages are at present quite red, showing that they are rather recent, for they become white previous to their absorption. You will notice also that the veins are extremely tortuous, and that the bottom of the physiological excavation is very distinct. In the right eye will be seen the white patches which indicate that changes are taking place in the hemorrhages. A typical Bright's neuro-retinitis shows swelling of the nerve, patches in the retina, venous hyperæmia, and the peculiar stellate appearance at the macula; but here you only find venous hyperæmia and hemorrhages. In speaking of kidney-disease, I have repeatedly said that where you find hemorrhages in the retina, among other things, you are to suspect kidney-disease. We know that the blood-vessels are altered in some forms of constitutional disease,—thus, in senile atheroma, syphilitic endarteritis, and the changes in the arteries due to poisoning of the system which occurs in uræmia. In this man's case the first diagnosis of kidney-disease was made by my ophthalmoscopic examination. Remember, then, that there is not always a typical condition of the retina in Bright's disease. I do not believe in therapeutic measures directed to the eye-lesions. If we are to hope for anything in the treatment of these cases, we must arrest, if possible, the kidney-trouble. The progress of this case shows that such treatment sometimes yields gratifying results. We know that in the acute forms of Bright's disease, such as occur in connection with pregnancy, when the patient recovers from the constitutional affection the eyes get well also.

In regard to the prognosis in these cases, it is obvious that it must be based upon the evidences of the constitutional disease; but in a general way we may say that the prognosis is bad when the eye is affected in chronic Bright's disease. If there be so grave a constitutional affection of the kidney as to produce structural changes in the optic nerve and retina, or to give rise to hemorrhages, it is evident that this is but a local expression of a grave poisoning of the entire system. Some years ago my colleague here, Dr. Gruening, by following to their ultimate issue a number of cases in which he had made a diagnosis of Bright's neuro-retinitis, found that every one of them died. I think I

would rather take my chances of a death-sentence under the law than a sentence founded upon this condition, for I might escape through the intricacies of the law, but I would hardly fail to become a victim of Bright's disease. This prognosis is not true of the acute forms of kidney-disease. If a woman develop acute kidney-symptoms during pregnancy, and there is consequently an affection of the eyes, and if her kidneys were healthy at the time of her conception, and the present trouble is entirely due to the pregnancy, the prognosis is good; but you must always remember that there may have been a pre-existing chronic kidney-disease. I studied this subject very carefully some years ago, and I was surprised to find that a number of good authorities state positively that kidney-disease does not occur in the course of pregnancy unless the patient already has chronic kidney-disease. I can hardly believe this, for I know of cases of permanent recovery from neuro-retinitis and other symptoms of Bright's disease, as the result of a premature delivery of the patient, either naturally or by artificial means. As in this case, the disease nearly always affects both eyes.

What kind of kidney-disease is it that ordinarily affects the sight? This is a question which cannot be positively answered, but the weight of present opinion is in favor of its being of that form which is associated with the small, contracted kidney, and which is essentially slow in its progress.

As a matter of differential diagnosis, I would call your attention to retinal hemorrhages occurring from other causes. In patients who have reached the beginning of old age we find not infrequently retinal hemorrhages without evidence of either kidney- or heart-disease. These patients come to you with sudden deterioration of sight, and this may be confined to only one eye. In such cases you do not find the small petechial hemorrhages as in this patient here, but very large ones, which give rise to much amblyopia, or even to complete loss of sight. They occur in connection with other senile changes. If the hemorrhages were not repeated, the prognosis as to sight would be quite good; but, unfortunately, they are very apt to recur, and many of these patients ultimately die of apoplexy. When there is a large retinal apoplexy, I think it is your duty to warn, not the patient, but the friends, of the gravity of the situation. There is a form of hemorrhage called in the text-books "*neuro-retinitis apoplectica*,"—a very bad term,—where there are extensive striated hemorrhages which follow the course of the nerve-fibres, and which are probably due to thrombosis of some of the vessels. You should also be able to exclude hemorrhages from injury. In inflammations of the optic nerve and retina dependent upon syphilis,

hemorrhages are very seldom present, but they are frequent from diseased conditions of the blood-vessels, and hence, under these circumstances, you should remember that syphilis may be the cause of the whole trouble.

TRACHOMA.

This boy has had his eyes treated for trachoma by expressing the follicles so as to press out their contents, which is done either with an instrument or with the finger-nails. I operated on the right eye and one of my colleagues on the other. I made the expression as thoroughly as possible, the boy being etherized, and the operation occupying one hour. The left eye was operated upon under cocaine. This plan of treatment, which is now being revived, is not, as some consider it, a new method, but seems to me a very valuable addition to the treatment of granular lids, and I am surprised that it fell into disuse, because in one case, at least, which I treated in this Polyclinic, where I operated upon both eyes, the trachoma was entirely cured. To cure a disease like this, which is essentially a chronic one, in a single operation upon each eye, the duration of treatment being only two or three weeks, is certainly a marvellous improvement upon our usual methods. The operation, to be successful, I think must be done with the patient under the influence of a general anæsthetic. I tried it in one or two instances under cocaine, and it did not seem to me to allay the pain at all. One boy jumped up from the operating-table and ran into the street during one of these attempts. You will notice the difference between the right and left eyes in this boy: in the left, the trachomatous bodies are still to be seen, and I think this is entirely owing to the operation not having been done under general anæsthesia, for the operator is a very careful man. There is some cicatricial tissue, which I think is due to the treatment by sulphate of copper since the expression. There are only isolated trachomatous follicles to be seen, the conjunctiva is getting pale, and there is very little swelling. After squeezing out the follicles thoroughly, we cauterize the conjunctiva with sulphate of copper, rubbing a smooth crystal over the surface just treated by expression. This causes considerable reaction,—swelling of the lids and chemosis of short duration. I should not, however, be afraid to operate upon both eyes at once, for the reaction can be easily controlled by keeping the patient quiet and applying ice-cloths. The only precaution to be observed is to avoid abrading the cornea. The clamp-forceps devised by Dr. Noyes are in a measure useful for this operation, but they are by no means indispensable, and I think if the finger-nails be

rendered thoroughly aseptic, they will answer equally well. [Since gaining more experience in the performance of expression, I now very much prefer the roller-forceps devised by Dr. Knapp.]

Here is a patient who has been operated upon for entropion of an extreme degree, due to granular lids. I show her for the purpose of dwelling with emphasis upon the method of operating which I employ and which I recommend to you. I do not say, however, that the other methods are not good, but this has seemed to me to be the best.

In entropion there is a turning in of the eyelashes so that they rub on the eyeball and very naturally produce the most disagreeable results. This patient has maculæ of both corneæ, due to friction and irritation, which have given rise to corneal ulcers, which in healing have caused the maculæ. These impair vision, and therefore she has only $\frac{1}{10}$ with one eye and $\frac{3}{8}$ with the other. In severe entropion you will find not only the eyelashes turning in, but even the free margin of the lid, so that the lid has not only lost its graceful outline, but it is reefed in, just like a sail. This was the condition in the patient before us. If you will evert the lid of such an eye and carefully examine the conjunctival lining, you will nearly always find scars. There is hardly such a thing as chronic trachoma healing without resulting scar-tissue. This spoils the curve in what is called the tarsal cartilage, so that the lids are turned inward upon the globe. The tendency of cicatricial tissue is to keep contracting, and hence these cases grow worse. In making up your mind what operation to select, you will be guided by the fact that you must make some scar-tissue in the back of the lid, which shall counteract the scars of the conjunctiva on the inner surface of the lid. Many such operations have been devised, but the one I recommend is a modification of Snellen's, and consists in removing from the back of the lid a small piece of skin. The amount so removed will depend upon the fulness of the tissue in the lid. The incision is made two to four millimetres above the line of the lashes, being careful not to go so near as to wound the hair-follicles. Having removed the skin and the orbicularis fibres, you reach the tarsal cartilage. You then groove this cartilage from the inner to the outer commissure, and remove a strip therefrom. Graefe's cataract-knife is the best instrument for this purpose. Make one incision almost vertical and another meeting it obliquely; then with scissors dissect up the strip. In some cases you may cut through the lid; it should be avoided, if possible, but it is not of much importance. Some operators even remove, in bad cases, the entire tarsal cartilage. You next stitch the parts, the first stitch being passed through the skin and the lower end of the tarsal cartilage,

then through the upper part of the tarsal cartilage, and, finally, deeply up under the skin. This causes immediate eversion of the eyelashes. You will rarely get union by first intention throughout the wound, nor do you wish it. You desire the healing process to cause the formation of cicatricial tissue. This operation, if done carefully, will succeed in a large proportion of cases. The instruments necessary are not only the knife, scissors, and forceps already mentioned, but entropion forceps or the clamp devised by Dr. Knapp, which is so constructed that the whole lid is exposed for operation, and at the same time the hemorrhage is controlled. The objection to many similar instruments is that the ring covers a considerable portion of the lid. If the entropion is partial, your operation may be limited so as not to include the part of the lid which is really inverted.

This patient was operated upon three months ago yesterday, so that sufficient time has elapsed to show the result. In the left eye the result is perfect, but in the right eye there is a slight turning in of the eyelashes at the outer angle, and that is due to the operation not extending up quite to the outer canthus, as I thought that there was not sufficient entropion in this portion. Her vision has improved to $\frac{7}{8}$ in one eye and $\frac{3}{8}$ in the other. Many operators operate by another method, which gives excellent results, but the one I recommend has worked well in my hands, and I always advise you to hold on to such methods as in your own hands have proved most successful.

In this colored boy, you know, I diagnosed traumatic iridocyclitis, and the interesting feature is that it has been caused by a contused wound. The pain on pressure is gone, and we can now say almost certainly that he will get well, as the cyclitic element, which was what we feared, is now well under control.

SYMPATHETIC OPHTHALMIA.

In a former lecture I spoke of the kinds of wounds likely to produce sympathetic ophthalmia. Those of you who were present will remember that we placed as most important penetrating wounds of the sclero-corneal margin with or without entrance of the foreign body, then prolapse of the iris, and lastly contused wounds without rupture of the eye or displacement of the iris. Sympathetic ophthalmia we know may follow operative wounds, and this opens up a chapter of much interest and great responsibility. If it be true that in an operation for restoring a patient's sight we not only may not succeed, but may produce sympathetic ophthalmia in the other eye, the responsibility of all ophthalmic surgeons is greatly enhanced, and it must

be known that this is a possible occurrence. Many years ago Mr. Critchett, of London, introduced an operative procedure which, so far as I know, was among the first to give rise to sympathetic ophthalmia. This operation, which has fallen into "innocuous desuetude," is known as iridodesis.

You know that in cases of dislocation of the lens, or of central opacity where there was an obstacle to central sight, operations have been performed to displace the pupil towards the direction where the cornea was clear. They have not often been successful, because the curvature of the cornea was altered, and the new pupil was not in a good optical condition. Again, when done for central opacity, especially in zonular cataract, the operation often gives very trivial improvement; hence that operation should only be chosen after careful consideration. The objection to iridectomy was that a large portion of the iris was removed, and the circles of dispersion were so great that vision was not very good; Critchett therefore advised making a small wound in the sclero-corneal margin, drawing the iris far enough to bring the pupillary margin into the wound, and tying it there with a thread, leaving the portion embraced in the thread to slough off. By this operation the pupil was placed in the desired direction, with the pupillary margin still remaining, and the action of the sphincter also remaining, so that the new pupil could dilate and contract with the impulse of light. Theoretically it was a beautiful operation, and practically it gave splendid results, and it was thought to be a decided improvement on former methods; but very soon afterwards a case of sympathetic ophthalmia resulted from it, and about this time Graefe reported a case where he had done this operation on both eyes. The patient had left his care with very good vision, but had returned a few months afterwards with both eyes destroyed from irido-cyclitis. Graefe attributed this result to the stretching of the irides incident to the iris being fastened in the scar, but Mauthner raised the question whether it was not more likely that there was first an irido-cyclitis in the wound, giving rise to sympathetic trouble in the other eye. This seems to me a more rational explanation than to assume an almost simultaneous primary inflammation in both eyes. Soon after this a case was reported where one eye only had been operated upon, and the other, which was perfectly good, was affected with sympathetic ophthalmia; both eyes were lost. In the discussion which followed, Critchett said he had never seen sympathetic ophthalmia in all his cases, but the operation has nevertheless been entirely abandoned.

The operation known as iridectomy, which is usually innocuous, has also been followed by irido-cyclitis and sympathetic inflammation

of the other eye, but I think, if it is properly done, this result must be very rare. In the twenty years I have been operating, I have never seen in my own hands a bad result from iridectomy, although I have known of such cases occurring in the experience of others. In all the iridectomies which you make, you should be very careful that the angles of the wound are free from adherent iris, for long after the patient passes from your observation this may give rise to sympathetic trouble. By far the most interesting, although sad, cases are those which have declared themselves after the extraction of cataract. Such cases occurred when the old flap extraction was in vogue. This consisted in making a large flap, embracing one-half or more of the cornea, and then extruding the lens, either with or without iridectomy, after opening the capsule. Since the introduction of Graefe's linear method, however, the cases of sympathetic ophthalmia have been more frequent. Even with such a sad drawback, the statistics of cataracts have in the main been better than by the old flap method, which gave rise to other accidents.

In Graefe's operation the incision lies in the natural contour of the eye, and as nearly as possible in the sclero-corneal margin; in fact, the more directly the line corresponds to this margin the more characteristic is the Graefe operation. Latterly the incision has fallen more within the cornea. The danger of producing irido-cyclitis lay just in the situation of this incision in the new operation, and it was not very long after the operation became general before cases of sympathetic ophthalmia were noticed. In 1869 a patient of Dr. Knapp's lost both eyes from sympathetic ophthalmia after extraction of cataract. If I remember correctly, a successful extraction was made in one eye, and after it had completely recovered the extraction was made in the other. This second operation was attended by certain difficulties, and it was followed by irido-cyclitis and the loss of both eyes. After this a number of cases followed, and in a discussion at one of the Ophthalmological Congresses, many more were reported.

If this is to be your method of operating, this danger should be ever in mind. I now have a patient, residing out of town, in whom I constantly fear sympathetic ophthalmia will develop in the uninjured eye. She had a traumatic cataract from the penetration of a pin in the sclero-corneal margin and lens, giving rise to cataract. It had to be extracted before it was ripe, on account of swelling and secondary glaucoma. The operation was followed by irido-cyclitis, but she has refused enucleation. The shrunken stump is painful to the touch, and she is constantly menaced with sympathetic ophthalmia.

It will be interesting to note in the future whether sympathetic ophthalmia occurs more or less frequently in "simple extraction," now largely practised. It is, in a measure, a return to an old method,—i.e., extraction of the lens without iridectomy, together with some innovations in the technique of the operation. The incision is made in the cornea with Graefe's knife, but not as much of a flap as formerly; the lens is extruded without iridectomy, and eserine is used to prevent prolapse of the iris. It gives very beautiful results. The pupil responds to light, vision is better, and if the operation be successful the result is excellent; but I apprehend we shall hear considerable of resulting sympathetic ophthalmia. The great danger is incarceration of the iris, for I have seen it in many cases, and these often develop irido-cyclitis and sympathetic ophthalmia in the other eye.

In regard to other operations producing sympathetic ophthalmia, I may say that the operation known as discission of cataract is sometimes responsible for this complication. I have seen severe reaction after this operation, but I have never seen an irido-cyclitis or sympathetic trouble. Mauthner, however, says such cases have been reported. The danger is very much greater in cutting the capsular membranes left after a cataract extraction, and this is especially likely to be the case if they are tough, and if the operation be done long after the extraction. It is comparatively easy to perform the secondary operations if the proper time be selected, and this should be as soon after extraction as the eye becomes free from all other symptoms of irritation. At this time the operation is easy and free from danger, but when you cut into the secondary membranes after they become old and tough, you drag on the ciliary processes, and just in proportion to the amount of trauma inflicted by the operation is the danger of exciting irido-cyclitis.

I conclude the category of operations likely to give rise to sympathetic ophthalmia by reference to the methods of removing staphylomata of the cornea. Mauthner, in his book,—so complete in most respects,—has neglected this. It is usually supposed, where there is staphyloma of the cornea, that the operation for its removal, which is for a cosmetic effect, cannot be attended with any considerable danger, on the supposition that the ciliary nerves, which are supposed to transmit sympathetic disease, have been destroyed. Another method of Critchett's is responsible for these cases of sympathetic ophthalmia which have come from operating upon staphylomata. This method consists in thrusting through the base of the staphyloma four to five curved needles of considerable size, each carrying a suture. They transfix the base of the staphyloma, which is then cut off with Beer's

knife and scissors ; then the needles are drawn through and the sutures tied. The result is a very pretty stump. Simple as this operation seems, it has in several instances excited sympathetic ophthalmia. The best method of all is that devised by Knapp. It consists in pursing up the conjunctiva around the staphyloma, just as you would pucker up the mouth of a tobacco-pouch, in such a way as to cover the defect left by cutting off the staphyloma. This does away with the danger mentioned, because the needles do not pierce the ciliary region. The wearing of artificial eyes on sensitive stumps, especially where there is still transparent cornea, or where the eyeball itself is at all irritable, is likely to give rise to sympathetic ophthalmia ; and there are instances on record in which an irritable nerve has been left, and has transmitted the sympathetic ophthalmia.

Laryngology, Pharyngology, Rhinology, and Otology.

DEVIATED SEPTUM.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL
SCHOOL.

BY CHARLES H. KNIGHT, M.D.,

Professor of Laryngology and Rhinology in the New York Post-Graduate Medical
School; Surgeon to the Throat Department of the Manhattan Eye and Ear
Hospital, New York.

GENTLEMEN,—The first case we have to examine to-day represents a very common and troublesome type of disease,—deviated septum. The patient is a boy, twelve years of age, whose mother tells us that she has noticed for the past two years that he has been unable to breathe freely through the right nostril. The difficulty has been gradually increasing until now he cannot inspire except through the left side, the right ala collapsing with each inspiration. The boy sleeps with open mouth at night, breathes heavily, and it is observed that his voice has a nasal quality. His general condition seems to be good. On raising his head and illuminating the orifices of the nose, we see that the right naris is occluded by a red, tumor-like mass, beneath which I am barely able to pass a fine probe. On looking into the left nostril, we find a corresponding concavity, with a wide expansion of the latter passage. On using the rhinoscopic mirror, and making a post-nasal examination, nothing abnormal can be found beyond a slight congestion of the rhino-pharynx. It is obvious, then, that we have to deal with a deflection of the septum, involving only the quadrangular cartilage.

The etiology of these cases has been a subject of much discussion. The condition appears very early in life, and has been pronounced by some observers to be congenital in certain cases. A very small propor-

tion of the patients thus affected have syphilis, but it is very doubtful whether syphilis is an etiological factor in the production of the deformity. Occasionally these cases are observed to be scrofulous, but so rarely are they distinctly so that we cannot consider scrofula to be a predisposing cause of this condition. Seiler, of Philadelphia, and others have observed an extreme degree of hypertrophy of the turbinated body on the concave side of the deviated septum, which has led them to conclude that the enlargement of the turbinated tissue was the cause of the deflection. When we pause to consider the function of the turbinated bodies, we shall probably be led to the opinion that the hypertrophy is rather a consequence than a cause of the deviation. The erectile tissue covering the inferior turbinated body is placed in the position it occupies for the purpose of warming, moistening, and filtering the inspired air. When the septum becomes bent to one side, an undue volume of air is admitted to the nasal chamber, and the turbinated tissue, in order to accomplish its function, must undergo enlargement. Were the reverse true, we should probably find that pressure from the hypertrophied turbinated body sufficient to push the septum out of the median line would at the same time induce erosion or ulceration of the septum, conditions which are never found to exist in these cases except upon the convex side of the septum. We therefore conclude that the hypertrophy of the turbinated body is not the cause but is a result of the deviation. Undoubtedly, in the vast majority of cases, traumatism is a prominent etiological factor, although in but a few can we find a distinct history of injury. Repeated trifling blows on the nose from falls, or otherwise, may lead to a bending of the cartilage, which becomes still further aggravated as the child develops, in consequence of a chronic inflammation of the Schneiderian membrane resulting from the obstruction. The frequency of the lesion is very startling. An examination of a large number of noses in the living subject, and of a still larger number of skulls in various museums, has led Morell Mackenzie to conclude that deformities in varying degree exist in at least seventy per cent. Zuckerkandl's examination of the cadaver showed that about forty per cent. of the cases examined presented more or less distortion of the septum. In a large proportion of cases the deviation is accompanied by more or less thickening—ecchondrosis, hyperchondrosis, or exostosis—of the septum. An attempt has been made by many observers to classify these deformities. Loewenberg has divided them into vertical, horizontal, and irregular, subdividing the horizontal into superior and inferior. Various modifications of this classification have been proposed. In view of

the gradations and variations in the situation and shape of these deformities, the practical utility of such a classification is not apparent. The traumatic theory of causation receives more or less substantiation from the fact observed by Bosworth and others, that they are apt to lie along the sutural lines,—that is, we find them running obliquely upward and backward near the junction of the quadrangular cartilage with the vomer and with the perpendicular plate of the ethmoid. In the particular case before us it is observed that the deviation is not restricted to either of those situations, but seems to involve the entire cartilage, giving one the impression that there has been an overgrowth, as though the development of the median support of the nose had continued long after the bones of the face had become consolidated, so that there was not room enough in a vertical line to accommodate the septum, and consequently bending took place. Deviations vary greatly in shape as well as in situation; in some cases they are distinctly angular, and present quite a sharp, prominent edge, which in the course of time may become eroded, or even ulcerated, either in consequence of injury induced by the habit of picking the nose with the finger, or as a result of other irritation, such as the violent blast of inspired air upon the cartilage.

The symptoms referable to this condition are ordinarily simply those of nasal stenosis, and we find our patients complaining of inability to breathe satisfactorily through the obstructed nostril, and frequently, as in this case, while expiration on the stenosed side can be carried on, when the patient undertakes to inspire, the ala of the nose is drawn against the prominent cartilage in a valve-like fashion, and entirely cuts off the current of air. Not uncommonly there is a considerable degree of external deformity. In tracing the outline of the cartilage with the fingers, we find that the anterior margin is displaced to one or the other side, and the tip of the nose may be tilted. We observe, too, that the nostrils are unsymmetrical, one being much larger than the other. In addition, the effect upon the timbre of the voice is frequently quite marked; there is a lack of resonance which is often quite characteristic. Finally, we sometimes meet with a variety of reflex symptoms which are to be distinctly attributed to this deformity. They are much more common in patients of a neurotic temperament. These symptoms consist of various disturbances of audition and of vision. A few cases are on record in which a choreic movement of the facial muscles on the affected side was dependent upon this disorder. The diagnosis is seldom attended by any difficulty, provided a careful examination be made. The condition has, however, been mistaken for

nasal polypi, for echondrosis, and for exostosis, and it has occasionally happened that the tubercle of Zuckerkandl—that aggregation of erectile tissue which is symmetrically placed on each side of the septum at the level of the middle meatus—has been looked upon as a deviation of the septum, and the attempt made to remove it.

It is obvious that the treatment of this condition must vary with the situation and shape of the deformity. In young subjects, in whom we generally have to deal with a deviation pure and simple, something may be accomplished by persistent pressure with the finger upon the convex side of the septum. There is one danger, however, in resorting to this procedure,—namely, that the irritation resulting from the pressure may excite a perichondritis, or an inflammation of the cartilage itself, which will eventually lead to erosion of the cartilage and perforation of the septum. This procedure is not available when the cartilage is very much thickened or is excessively redundant. In the latter case, relief from the symptoms may be obtained by the simple process of slicing off with a knife the excess of cartilage, and so restoring in a measure the calibre of the nasal passages. Heylen and, more recently, Roberts have recommended submucous resection of the overgrowth, a curved or V-shaped incision being made in the soft parts, and the flap thus formed is dissected up with the perichondrium, in order to expose the subjacent cartilage, which may then be removed with a chisel, saw, or knife. In adults, and in cases of long standing at any age, the knife cannot be used effectively, for the reason that we often find that the cartilage is beginning to undergo ossification.

Several methods of external operation may be referred to. The first is that of Demarquay, who recommended a median incision along the dorsum of the nose, in order to expose the interior of the nasal chambers. Post modified this method by making his incision along the alar fissure. He recommended separating the columna and tilting the nose upward. Rouge resorted to a still more radical procedure, which has been recently again proposed for a simple deviation, consisting in a separation of the upper lip, together with the tip of the nose, the tissues being divided by an incision along the gingivo-labial furrow, thus avoiding an external incision. Such radical procedures would hardly seem to be warranted by the condition, and it can certainly be equally well treated by less heroic measures. A simple method of giving the patient relief was first suggested many years ago by Blandin, who was in the habit of cutting out an oval portion of the redundant cartilage by means of a punch, no attempt being made to remedy the deformity. It is difficult to see how this

method could give the patient much more than imaginary relief, especially in those cases where the deformity extends so far backward as to involve the vomer itself. This method was modified by Steele, who used a stellate punch. The cartilage having been divided, the triangular fragments thus formed could be pressed over to the middle line, where they were held in position by plugging the nostril. The most rational operation and one of the most effective methods of dealing with these cases is that suggested by Adams, who was in the habit of seizing the cartilage with a pair of broad-bladed forceps and by a turning and twisting process detaching it. Having made it perfectly loose, a fixation clamp was adjusted, followed after three or four days by the insertion of ivory plugs into the nostril, which were retained long enough to insure against recurrence of the deformity. It is the custom of Jarvis to transfix the projecting and thickened cartilage with a needle and remove the excess with a cold-wire snare. He also has devised a rongeur forceps for nibbling off the excess of cartilage. When the cartilage has become ossified, or when the deformity involves the bony tissue at the posterior part of the nasal chamber, a flat or concave chisel, as suggested by Seiler, will be found very useful. In the majority of cases, when the cartilage is greatly thickened as well as deviated, the best instrument for remedying the deformity is the saw. It has the advantage of giving a clean, smooth wound, upon which the secretions are not apt to be retained and undergo decomposition. The angular hand-saw of Bosworth, or a straight saw, the latter having the advantage that it can be used in both an upward and a downward direction, may be selected. It is obvious that no more tissue can be removed than the cutting edge of the saw is able to reach, so that a wound which looks very well immediately after operation will in the course of repair become filled up with new tissue, until after the lapse of some weeks we shall find more or less of a recurrence of the original deformity. This objection to the saw does not apply to the various drills and trephines which are in common use and which are operated by the electro-motor. With the latter instrument we are enabled to go to any desired depth and produce a concave wound which gradually fills up to the general surface. The hemorrhage after all these operations upon the nasal septum is frequently very profuse. The use of chemical hæmostatics is, as a rule, not to be recommended. One of the best methods of controlling the bleeding is by the insertion of pledgets of cotton soaked in very hot water, or by irrigation of the nasal fossæ by a stream of hot water from a fountain-syringe or an ordinary nasal syringe. It is seldom necessary or

desirable to plug the nostrils for hemorrhage after such operations, and we can dispense with plugs for retaining the septum in position if we resort to a mode of treatment suggested by Roberts, of Philadelphia. It is a combination of various procedures which have been referred to, with certain modifications. It consists in making an incision with a bistoury through the septum at its most prominent point; the forefinger having been passed into the nostril on the convex side of the septum, a sharp-pointed curved bistoury is introduced into the concave nostril, the septum punctured, and the blade of the instrument drawn down towards the tip of the nose in such a way as to make a complete division of all the structures composing the cartilaginous septum. The upper and lower fragments thus formed are seized in succession by Adams's forceps and separated from their attachments without laceration of the mucous membrane. The secret of success lies in this step of the operation. The resiliency of the cartilage must be completely overcome by thorough detachment of the fragments, which are afterwards to be held in position in the following manner: a brass pin about two inches long is passed through the columna from the concave side; it is then turned and passed obliquely upward and backward across the incision previously made, through the cartilage above and beyond the incision, its point being buried in the soft tissues covering the vomer. The head of the pin is provided with a leaden ball which may be compressed on the shaft, and which is concealed in the vestibule of the naris, the excess of the pin being cut off with forceps. Thus the deformity is over-corrected, and we find that the nostril originally patulous is now less free than the nostril formerly occluded. The pin should be allowed to remain in position for at least a week; on its withdrawal, we shall find that the cartilage will gradually spring back towards the middle line and perhaps even beyond it. We shall also find that the fragments have overlapped each other in such a way as to lead to a considerable thickening of the tissues, which may require to be shaved down with a knife or with a cautery. The advantage of this method of handling simple deviation of the septum consists in the fact that we are able to dispense entirely with plugs, and nasal respiration is permitted during the entire period of convalescence.

The after-treatment is very simple. It consists merely in keeping the patient quiet and in daily irrigations of the nostrils with almost any of the well-known detergent solutions,—either Dobell's solution, or a solution of boric acid, or, better still, a solution of oil of eucalyptus or eucalyptol in fluid albolene, in the proportion of twenty drops of the

oil to one ounce of albolene. The last-mentioned combination includes antiseptics and protection to the wounded tissues, and prevents the accumulation and decomposition of irritating secretions. In addition to a necessity for removing thickened pieces of cartilage when the fragments have overlapped, we shall not infrequently find projecting from the floor of the nose in these cases a spur or ridge of bony tissue, which will require removal by means of the saw or chisel.

ACUTE DISEASES OF THE TONSILS.

CLINICAL LECTURE DELIVERED AT THE VANDERBILT CLINIC.¹

BY GEORGE M. LEFFERTS, M.D.,

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GENTLEMEN,—It is a practice among many medical men to be less particular than they should be in their classification of tonsillar diseases. With a certain class of gentlemen two terms cover all acute diseases of the tonsils,—quinsy sore throat and diphtheritic sore throat; sometimes there is added ulcerated sore throat. The public also are extremely apt to speak of diphtheritic sore throat,—a delusion in which they are encouraged by their medical advisers. As a matter of fact, all the acute diseases of the tonsils are perfectly distinct in their appearance, their pathology, and their symptomatology. As for their classification, I would say that inflammation may attack the parenchymatous tissue of the tonsils, or it may attack the secreting tissue of the tonsils, or it may attack the tissues that lie about the tonsils. If it attacks the parenchymatous or peri-tonsillar tissue, it will, in ninety-nine cases out of a hundred, terminate in abscess,—quinsy sore throat. If the secreting tissue is attacked, you will rarely see an abscess, but will have follicular tonsillitis. Now, this is certainly a very simple classification, and seems to me to cover all inflammatory affections of the tonsils which you will be ordinarily called upon to treat. If the inflammatory process attacks the parenchymatous tissue of the tonsils, it usually terminates in abscess. The abscess may be located in the interior of the tonsil, but you will rarely be able to discover its situation by palpation. An abscess will usually occur, however, outside of the tonsil; it may occur behind the tonsil, to the outer side, or in front of the tonsil. You then have a peri-tonsillitis, and ordinarily you will find the collection of pus to the upper and outer side of the tonsil. If the abscess is

¹ Tuesday, February 16, 1892.

situated in the interior of the tonsil, it will be utterly useless, in the majority of cases, to take a sharp-pointed knife and penetrate into the tonsil with the idea that you will be fortunate enough to strike the purulent collection. You are not able to locate it exactly, nor will you know when it breaks nor where it breaks, excepting that your patient tells you that he has experienced immediate and wonderful relief. When the abscess lies outside the tonsil, palpation will enable you to see where it points, and show you where to open it.

In acute follicular tonsillitis there is an inflammation of the secreting tissue of the tonsils. The inflammatory products, mixed with mucus, gradually dam up a little follicle or crypt until the mouth is reached; the secretion overflows and forms a whitish or yellowish spot on the tonsil. Instead of affecting only one crypt or follicle, it may affect a dozen or more; each follicle in an active state of inflammation, each filled up with this cheesy mass which overflows and distributes itself on the surface. These masses may coalesce and form a pseudo-membrane, yellow or white in color, and both tonsils may be covered by it. Now you can add to this picture the fact that these tonsils are enlarged by the inflammatory process; that they are angry-looking, projecting tumors; that if both are inflamed they may meet in the median line. The disease may commence with a chilly feeling, followed by a temperature of 101°, 102°, 103° F., and in children even 104° F. There is marked prostration accompanying the disease.

I will speak of two errors in diagnosis. The first is the tendency to call these cases of acute follicular tonsillitis ulcerated sore throat. Ulceration of the tonsils is extremely rare, except in syphilis and cancer. The second error in diagnosis is sometimes extremely difficult to avoid. It is to call acute follicular tonsillitis diphtheritic sore throat, and by that I mean diphtheria. It is a diagnosis which the practitioner is constantly called upon to make. With a little knowledge of the natural history and appearance of the two diseases, you can usually make your differential diagnosis. Take a case where there is a confluence of the pultaceous masses, forming a pseudo-membrane which covers more or less of the tonsils: it closely simulates what is called catarrhal diphtheria,—the milder form of pharyngeal diphtheria. I will mention the two simplest methods of making the differential diagnosis, throwing out of consideration the microscopical examination of the membrane and other tests which are impracticable when the physician is quickly called upon to decide whether the child should be isolated or not. The first is: if it be diphtheria, the membrane will be

adherent and cannot be raised without leaving an abraded, perhaps bleeding, surface beneath it. If it be the result of the coalescence of the products of several of the follicles,—in other words, acute follicular tonsillitis,—you can lift up that pseudo-membrane, and see that it is drawn out of the pits or follicles as you pull it away, and can afterwards pass your probe into their open mouths. The second diagnostic point is this: if the case be one of diphtheria, and the tonsils are well covered with the diphtheritic membrane, the chances are that the membrane will extend and that you will see a patch upon the uvula, the soft palate, or the posterior pharyngeal wall. If the case be one of acute follicular tonsillitis, that pseudo-membrane will never leave the tonsils.

How are you going to treat your case of acute follicular tonsillitis? The attacks are usually recurrent. The first point, then, is the preventive treatment,—that is, simply to remove those tonsils in the interim between the recurrent attacks. If the preventive treatment has not been employed, what can you do? Can you abort the disease? This can perhaps be done by a large dose of quinine, if it is taken early enough; or aconite may do it. Fleming's tincture of aconite may be given in doses of one minim every hour until three doses have been taken, or until the physiological effects of the drug are obtained,—the peculiar dryness of the fauces, with the tingling sensation. Antipyrin for the fever, and later quinine, will now be the rule.

After the disease has once become established, the inhalation of steam as hot as can be borne is grateful to the patient in the earlier stages. This relaxes and softens the tense parts and loosens the pseudo-membrane, enabling you to draw it out from the inflamed follicles. Gargles I do not recommend, nor are astringent sprays likely to be of any use at this stage. After the acute stage has passed off, the thing to do is to brush those tonsils with a broad throat-brush dipped in a solution of the tincture of the chloride of iron, one drachm to the ounce of glycerin. This solution, applied each hour to the inflamed tonsils, is the best remedy I know of. The ordinary throat-brush sold in the drug-shops is utterly useless. I employ a broad, flat brush, sold in the paint-shops, which is used by the kalsominers. It is about one inch broad, and stiff enough not to bend on itself.

This same solution of iron, given in drachm doses internally, is a useful addition to your local treatment. Later on, when the pseudo-membrane is thrown off, you can commence with the local application of astringent sprays, made three or four times a day. For this purpose employ the sulphate of zinc, the chloride of zinc, or the ferri et ammonii

sulphas. The constitutional indications must be met with quinine, etc., and a nutritious diet should be given.

A word or two next of quinsy sore throat. Picture to yourself a patient who is unable to move his jaws except with intense pain; unable to swallow without constant fear of the regurgitation of fluid into the nasal passages; the breath exceedingly fetid; high fever; profuse secretion of saliva. The patient is sleepless, and even delirious. The relief you can give your patient, when the abscess is formed and you can feel fluctuation, is to open it at once. The preventive treatment of this disease, as in acute follicular tonsillitis, is amputation of the tonsils. Even after this is done, the abscess sometimes recurs in the stump of the tonsil. Still, the chance is small and does not militate against the advisability of amputating the tonsils in patients who suffer from recurring attacks of quinsy sore throat.

The subject of direct treatment I approach with considerable hesitation. It is utterly impossible for me, in the limited time at my disposal, to give you even the names of the drugs that have been recommended for this disease. Every one in the *Pharmacopœia* has been tried at one time or another. Many have been warmly advocated, among them silver nitrate and guaiacum, specially for the purpose of aborting an attack. Possibly guaiacum may have done it; silver nitrate never has. When an attack of quinsy sore throat has once commenced it cannot be aborted. The common-sense surgical principle is this: there is an abscess forming either in the tonsil or in the peritonsillar tissue. The best thing to do is to apply constant heat and moisture, and try to bring it to a "head." As soon as you can make out fluctuation you incise it, and the disease is at an end. This is the common-sense treatment of abscesses in other parts of the body, and it should be applied to tonsillar abscesses as well. A small, square flaxseed poultice will fit just beneath the angle of the jaw, and have it constantly kept hot. Let the patient inhale steam or hold hot water in his mouth, with his head thrown backward. Do not give him gargles or drugs. When the abscess is formed, make a small incision, open it as I have told you, and give your patient that great and quick relief which inevitably follows.

CHRONIC PHARYNGITIS.

CLINICAL LECTURE DELIVERED AT THE RUSH MEDICAL COLLEGE.

BY E. FLETCHER INGALS, A.M., M.D.,

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GENTLEMEN,—This woman is thirty-one years of age. For the last ten years her general health has been very good, and during the same length of time she has been complaining of a smothering sensation in the throat. She says she has to clear the throat frequently, and at times, especially in cloudy weather, she experiences a feeling as if something were over her face, as a veil or heavy cloth, through which she is compelled to breathe. She says if she could clear out the throat she would feel better. She complains, also, of ringing in both ears. There is no wheezing or rattling. I find nothing in the larynx to account for the smothering sensations. We may possibly account for this after an examination of the chest. Upon examining her nose I find nothing there to account for the trouble with the ears. We have here what is spoken of as throat-deafness. Any form of deafness coming from throat-affections is classed under this head. Sometimes it comes from inflammation of the naso-pharynx, sometimes from pressure on the Eustachian tubes. There is nothing in the nares to account for this tinnitus aurium, so we apprehend that in this case the trouble in the ears and throat has come altogether from the pharynx. Upon examining the pharynx we find only a very little of the granular condition that was here some time ago. You will see a little welt raised up one-eighth of an inch on both sides. It is due to enlargement of a number of follicles. The woman has had some treatment. Her throat has been cauterized by the galvano-cautery.

This is a disease known as chronic pharyngitis, clergyman's sore throat, hospital sore throat, and by numerous other names. Of the means for treating it there are not many of any special value. The use

of astringent gargles and drugs, and the use of sprays, may be recommended, but they do not give very great relief to the patient. There are some cases in which I have found great benefit from the application of muriate of hydrastin to the naso pharynx,—one part of the latter to two of powdered acacia. Where there are follicles of deep-pink instead of red color,—that is, where there is simply a uniform deepening of the normal color,—you will very often get most excellent results from this remedy. This application should be made three times a week for a time, and subsequently less frequently. Some of these cases can be relieved very promptly in this way, but where there is much congestion it does not have much effect. Where it is of a light color I do not find much benefit from any of the local astringent applications. The astringents so used are very numerous. The vegetable drugs of this class I do not like; I prefer the mineral astringents. Chloride of zinc, some of the iron salts, or sulphate of copper, about twenty grains to the ounce of water, may be used. Have the patient use also some milder astringent spray at home. Quinine may be given in tonic doses three or four times a day. It will frequently be found that where this granular appearance exists there is at the same time a disturbance of the digestive organs. The latter should be carefully looked after and corrected.

In a large proportion of cases the trouble starts from the nasal cavity, which must be put into a healthy condition. In case the general health is poor it is well for you to look to that, and not rely entirely upon local treatment. In this case, however, where there is nothing of the kind, it is doubtful whether treatment of the nose or any internal medication would prove of any great value.

I omitted to speak of nitrate of silver as a remedy. It is one which is exceedingly unpleasant and which I seldom use except as a last resort. The London paste is a most useful caustic application in these cases. Another method is to cut through one of these large follicles and press a piece of nitrate of silver into it until you have a good cauterization. The galvano-cautery may be employed, and is the best means for getting rid of the hypertrophied follicles. Where there are long welts along the side of the pharynx I use a small electrode. These welts just back of the pillar will cause more pain and soreness than in any other place. I do not know of any means that will get rid of these as well as the galvano-cautery. Where the mucous membrane has the appearance of being two or three times as thick as it ought to be, you will use your various astringents and chemical caustics without very much satisfaction. You will finally have to resort to the

galvano-cautery in most of these cases. I have had rather better results by making a long, transverse cauterization with an electrode which has a wire about a centimetre in length. In this way you will be able to get rid of some of the most obstinate cases where other treatment has proved unavailing.

In the case which we have here there is nothing further to treat except the small welts on one side. The sensations she speaks of—that of wishing to clear the throat, and the smothering—undoubtedly originate in the pharynx. In any case complaining of smothering sensations you must examine the kidneys also. I find nothing in the heart or lungs to account for this. She voids urine frequently, but that is a symptom of no definite value in renal troubles. It would not be safe, however, to make an absolute diagnosis until the urine has been examined. I think the trouble comes entirely from the throat. I shall have a strong tincture of iodine applied to the pharynx in this case to-day, and would advise a repetition of the treatment about three times a week for two or three weeks.

FOLLICULAR PHARYNGITIS.

This woman has felt badly about four weeks, complaining of the throat at first and subsequently of pain through the temples and forehead. It is especially severe at night. There is dryness of the throat and pain when she swallows, but she has great discomfort sometimes, simply from the dryness. Within the last week she has become so ill that she has been obliged to give up work. I find her pulse to-day 118; skin hot, though moist. She has no appetite; thinks she has some fever. The tongue is coated white, but not thickly. She complains of no pain elsewhere, but feels thoroughly used up.

In this case, instead of the little welt at the side of the pharynx that I spoke of in the preceding case, we have a large welt about half an inch in width, with numerous little yellowish erosions or ulcerations over it, and in certain places yellow secretion beneath the surface. It has a rather worm-eaten appearance. It is not smooth, as in the other case, but slightly nodular. It extends down below the base of the tongue. It is quite difficult to depress her tongue, therefore we cannot see the whole throat. The tonsils and soft palate show nothing pathological. The base of the tongue is heavily coated.

The question of diagnosis here is not as simple as one might wish. This pain coming on particularly at night is very suggestive of specific trouble, but in that case we should be very likely to find symptoms pointing to constitutional trouble, which are absent in this patient.

We should also find a degree of ulceration much more extensive than this. We should find a large number of small ulcers. They are here an inch or so in diameter, and there are a number of these small ulcers. It has the appearance of chronic follicular pharyngitis. I am inclined to pronounce it a simple case of that kind. In consequence of exposure it has become worse, but the trouble is confined entirely to one side. It is very apt to extend across to both sides. Look at this case carefully. The temptation to pronounce it specific would be very great if you had not carefully studied similar cases without any specific history.

EXAMINATION OF PATIENTS—HYPERTROPHIED TURBINATED BODIES—ECCHONDROSIS.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL
SCHOOL AND HOSPITAL.

BY O. B. DOUGLAS, M.D.,

Professor of Diseases of the Nose and Throat in the Post-Graduate Medical School
and Hospital; Surgeon to the Manhattan Eye and Ear Hospital, Throat
Department; Fellow of the New York Academy of Medicine.

GENTLEMEN,—At recent clinics we considered the importance of a thorough knowledge of diseases of the upper air-passages, the progress which has been made of late in methods of studying and treating these diseases, and the instruments which are required for examination and diagnosis. To-day, before looking at any patients, we may well take a few minutes to study how best to approach them and how to ascertain with the least delay the cause of their troubles.

In examining patients we want, *first*, to secure their confidence. Very little can be done for those who do not trust us. The instinctive dread of pain makes them cowards, and the surgeon must have that in his heart which, expressed in his face and manner, will allay fear. By word and act he must soothe and give assurance that he would save from suffering and not needlessly cause it. A surgeon's sympathetic touch inspires confidence. He may be firm and decided; he must be skilful and kind.

Second. Have your patient sit by a table, so that he may rest his arm upon it, and take your position in front of him. His knees should be brought together, yours separated, one each side of his, or place your knees together on either side of his. Your patient should sit squarely facing you, otherwise his neck will be twisted, which would bring the constrictor muscles into prominence and might mislead you to think them a tumor in the pharynx; this would certainly destroy the normal symmetry of the parts. Have your light, instruments, and other appliances accessible. I prefer them at my right, but others have them at their left. It is much a matter of habit, though to avoid reaching across you must have them on your right, if you are right-handed.

Use your head-mirror over the eye nearest the light. Be ambidextrous in the use of instruments, if possible. With reference to the kind of light to be used, I would say the best is undoubtedly that from gas or oil. I have never been able to use electricity with entire satisfaction.

Third. Begin your examination by observing the external form and condition of the nose, mouth, and neck. Here you will possibly get a suggestion that will direct your further investigation. Ask your patient, "Of what do you complain?" In his reply you may learn not only that for which he consults you, but the quality of his voice,—whether hoarse, nasal, feeble, causing pain, etc.,—and if his hearing is impaired. Consider carefully, and record if possible, all subjective symptoms; then examine the mouth, fauces, and pharynx. Here you will pretty certainly find a clue to your patient's malady, to be followed up. If the cause of his trouble is not indexed here, and he is hoarse, examine the larynx. This you will do by having the patient protrude his tongue, which gently grasp between the thumb and forefinger of the left hand, the tongue being covered with a small, clean doily. Avoid drawing the tongue forcibly down on the teeth. Take the largest laryngeal mirror that you can use in his throat in your right hand, and warm it over the lamp by holding the glass towards the flame,—not the back of the mirror, for it is the glass that needs to be warmed. Test its temperature by touching the back of the mirror to the "anatomist's snuff-box," not to your face.

Hold the mirror as you would hold a pen, introduce it carefully but quickly, and press it gently against the soft palate at such an angle as will reflect to your eye the best picture of the inferior pharynx and larynx. Having the mirror set at a double angle with its shank—i.e., backward, with its right border twisted towards you—will enable you to change its reflecting surface by simply rotating the handle.

Like the pursuit of happiness, you will find this investigation beset with difficulties, but I assure you most of them will yield to your persistent efforts. In some cases we can never see into the larynx, owing to an overhanging epiglottis or other malformation.

The parts to be carefully observed in these examinations are the tongue at its base, the lower portion of each tonsil, the epiglottis, the aryepiglottic folds, the arytenoid cartilages, the ventricular bands, the vocal cords, and the trachea.

The appearances most likely to be found are varices at the base of the tongue and an enlargement of the lingual tonsil, which looks like a thickened mass below the papillæ circumvallatæ. The faucial tonsils may be enlarged in their lower section and require excision. The epiglottis

is variable in size and shape, and is subject to œdema, to ulceration from syphilis, tuberculosis, and carcinoma. The aryepiglottic folds, arytenoid cartilages, and ventricular bands are more rarely the seat of primary disease, but may become involved by disease from adjacent parts. The vocal cords are liable to acute and chronic inflammations, to ulceration from various causes, to numerous neoplasms and neuroses, to infective diseases, and to irritation from foreign substances.

But it would take more time than is allowed for this clinic even to mention the things we ought to know concerning this subject, and much longer if I attempted to tell all we do not know. Six weeks or six years would not suffice to exhaust the subject, because the lines diverge as we advance. At a future time we will continue this subject of examination and semeiology.

This first patient complains of pain "back in the nose." Her throat is unusually tolerant, so the examination is comparatively easy. Please observe the posterior wall of the pharynx. The appearance indicates a chronic pharyngitis. A mass of tenacious mucus covers a portion of the membrane. The superior pharynx appears not unlike the oro-pharynx. We find a varicose condition of the veins at the base of the tongue, but the tonsil of the tongue is not enlarged; the epiglottis and arytenoid cartilages are quite normal, but the vocal cords are of a pinkish hue, indicating some congestion, and there is a little swelling of the larynx above the vocal cords. It is an interesting and instructive case, and we must find the cause of all this trouble. Let us examine the nasal cavity anteriorly. We find an enlarged inferior turbinated body. An enlargement like this usually results from the irritation of acrid secretions, which would also cause the trouble found in the pharynx and larynx. The inferior turbinate is quite pendulous, and lies upon the floor of the nose. This condition is more likely to cause hoarseness and cough than any other which we find in the nose. It is specially true with persons who use the voice much. I will make an application of a ten-per-cent. solution of cocaine to this mass, for the double purpose of determining whether the tissue is permanently hyperplastic or simply swollen, and to lessen the sensibility of the part. An instrument which is very serviceable for removing this pendulous mass is Professor Smith's canula scissors; by rotating the inner canula a portion of the growth can be readily cut off. When this instrument is not at hand, we may use other scissors, and one of the best is Professor Knight's, which I show you. The former instrument is preferable, because it crushes the tissue and so lessens the liability of bleeding. We have not determined the cause of this woman's pain.

It is probably due to an involvement of the palatine nerve, as a branch of this nerve is distributed over the inferior turbinated body, and pressure here might be referred to posterior filaments. Under the influence of cocaine the swelling has subsided, but the turbinate is yet too large. We speak of it as an hypertrophy, though it is probably a hyperplasia; an operation will be required to reduce it. A linear incision with the cautery knife might be of service, although an application to a limited area by means of this wire probe, bent upon itself till the parts touch, of a saturated solution of monochloroacetic acid will answer the purpose very well in this case. I do not like chromic acid, for it may be absorbed and produce constitutional effects. I think that monochloroacetic acid or trichloroacetic acid is preferable to all other escharotics for the nose. A drop of carbolic or of monochloroacetic acid is sometimes injected directly into the tissue, but the objection is, we cannot regulate with accuracy the quantity injected, and the extent of the resulting slough is uncertain. I think if we reduce this hypertrophied mass we accomplish all that is necessary in this case. With Smith's canula scissors I will remove all tissue belonging to the turbinated body that lies on the floor of the nose.

This child has a sore on the upper lip and nose; has had a profuse discharge from the nose for the past year, the mother tells me. Now there is almost the appearance of erysipelas. I have seen several such cases of chronic cellulitis, due to the acrid secretions from within the nose. The child's fauces are red and so irritable that it is impossible to make an examination of the superior pharynx. She needs general as well as local treatment. The ammoniated mercury ointment, diluted with an equal part of vaseline or, preferably, of albolene, is an excellent local application, and should be used twice a day. I would also advise the internal administration of cod-liver oil. Her surroundings are probably unsanitary, and constitutional treatment is as important as local treatment for her.

The next patient has been here several times, and we have removed from each nostril parts of the middle turbinate, and from the right nostril a portion of the superior turbinate. His pharynx is covered with tenacious mucus, and back of the right posterior pillar is an inflamed mass, proving, as I think, that there is yet some trouble above, the secretions from which, flowing down, have irritated the lateral wall. Examining the nostrils, we find a bulging of the septum towards the right; it is not a deflection, for there is a corresponding thickening on the other side. The septum is swollen and in contact with the outer wall. A trouble of this kind would probably be greatly

benefited by a change of climate, for we presume, as in the last case, that his surroundings are not favorable to the restoration of health. A general tonic treatment,—for example, with maltine and cod-liver oil,—good nourishment, and pure air are the most important points at present in the treatment of his case. The primary cause of his trouble has been removed.

This next case, some of you will remember, had a marked ecchon-drosis, a thickening of the cartilaginous portion of the septum. The saw is the best instrument for removing such an obstruction, and in using it we would begin in this case at the lower portion and saw upward, removing sufficient tissue to leave a free nostril. In doing such an operation, one must carefully avoid making an opening through into the other nostril, as it is almost certain to increase in size, and eventually result in deformity of the nose. Remember that the existence of a fenestration does not necessarily indicate syphilitic origin. Sometimes the cartilage is very thin, and in removing the secretions the patient may produce a hole. In this case, if we cannot cut off the mass without making an opening, it would be better to break up its attachments, replace the septum in its proper position, and apply a perforated cork splint, as devised by Dr. Berens. In doing these operations take off just enough tissue to leave a clear passage, remembering that cicatricial tissue contracts, and six months after the operation you may expect a larger opening than immediately after the wound has healed.

Dermatology.

NÆVUS PIGMENTOSUS.

CLINICAL LECTURE DELIVERED TO THE SENIOR CLASS OF THE ST. LOUIS COLLEGE
OF PHYSICIANS AND SURGEONS.

BY A. H. OHMANN-DUMESNIL, M.D.,

Professor of Dermatology and Syphilology in the St. Louis College of Physicians
and Surgeons.

GENTLEMEN,—The disease, of which you have an example before you, is ordinarily designated mole. It is a very common affection, one which is unattended by any subjective symptoms, and for which relief is sought merely for cosmetic purposes or because the growth interferes with the comfort of the individual. Moles vary greatly in shape and size. You will find that they vary in size from that of the head of a pin to large areas involving considerable portions of the integument. They may be level with the skin or may be considerably elevated above its surface. They occur indifferently upon all portions of the body, and they may be flat, round, deeply pigmented, pale, or hairy. It is especially the latter class which constitutes so many of the so-called mother's marks. Large hairy moles are supposed to represent various animals, whereas large pigmented moles will represent fantastic objects according to the imagination of the individual giving them a name. Ginger-snaps, bats, moles, rats, and so on, are a few of the names which have been given to these moles, upon the assumption that they were mother's marks due to mental impressions made upon the mother while she was carrying a child, whereas they are nothing more than pigmentary hypertrophies of the skin; and although they have a tendency to enlarge after birth, you will find that, as a rule, they are congenital and vary their shape to but a small degree. It is a common thing to find moles of about the size of a split pea occurring upon the faces of individuals, and by some such a mole is considered quite an ornament when occurring near the upper lip or about the corner of the eye, whereas others undergo considerable mental worry when such excrescences occur upon the nose, especially near

its tip, or upon other prominent portions of the face, constituting a deformity, more especially in women. These moles may or may not have large, thick hairs protruding from them, but you will find that it is an invariable rule that when moles occur in women they will enlarge after the menopause, and very often become pedunculated where formerly they were sessile. A peculiar condition attends these moles, to which particular attention should be given, and that is that when they occur upon the face within certain lines they are apt to become malignant after middle age, and it is for this reason that their complete removal is to be advised; for although the individual may go to the grave without any malignancy being manifested in these growths, it is best to avoid any possibility of cancerous involvement occurring. As I pointed out in a former lecture (on verruca senilis), the area which is apt to become involved is included within four lines, drawn as follows: one drawn horizontally across the middle of the forehead, another parallel to it about an inch below the lower lip, and two vertical lines, each passing in front of the concha of the ear. It is within this area that these growths of a pigmentary character are apt to become epitheliomatous. In regard to large moles which are hairy, they are true deformities, which attract unfavorable attention and excite comment of an uncomplimentary character, and are very annoying to those afflicted with them, and, like the others, it becomes a matter of some solicitude on the part of the subject to get rid of them in such a manner as not to produce a greater deformity than existed prior to removal.

The methods of treating these deformities are various in character, in quality, and in the appearance of the results which are attained. The quickest methods probably are those in which a surgical measure is employed,—that is, excision. But in the face, excision is not to be recommended, because, unless a very skilful operation be performed, with specially-devised instruments, scars are apt to result, and in certain portions the scars will be such as to increase the deformity rather than to diminish it, and manifestly this is not the object of an operation. Besides, patients fear the knife, and are very apt not to consent to an operation, whereas they would gladly submit to other means if they could be assured that they would be equally efficient. Caustics and escharotics are still less indicated, simply from the fact that when you use these agents you destroy the tissues; and no matter how well you may limit their action, you will find that you cannot limit it exactly to the surface of the integument, and as a consequence you will have one of two results,—either you will have destroyed the mole incompletely, or you will have destroyed not only the mole but

also a portion of the skin, and the result will be a scar as large as or larger than the original deformity, and certainly a scar cannot be regarded as much of an improvement over a nævus of this character. So that, no matter how willing the patient may have been to submit to this form of treatment, you will get very little thanks, after the conclusion of the case, for such a result. It is for these reasons also that the thermo-cautery and the electro-cautery are not good measures to employ. You cannot limit their action perfectly, and they are rather clumsy instruments to use in cases of this kind. Upon the whole, the method which I should recommend, and which I shall exemplify upon this case, is that of electrolysis. You will find that the electrolytic treatment can be perfectly gauged, that it can be limited to whatever portion you desire, and, moreover, that its action, while thorough, is not so destructive as to bring about the formation of scars or deformities which are worse than the original trouble. The method is one which requires some little care and attention, not only as to the general use of the battery and the electrodes, but also as to the manner in which the particular electrode that is used for the destruction of tissue is employed. The battery you use is, of course, a constant galvanic battery, having a strength, let us say, of five or six milliampères, and this you should always carefully gauge, so as to know what sort of a force you are handling. The positive electrode should be a sponge, wet with a salt-water solution, and rather large, so as not to produce irritation of the skin with which it comes in contact; while the negative electrode is to consist of a needle-holder holding a steel needle of fine calibre, and provided with a switch by which you can cut off the current at any desired time, or turn it on,—this being much more practical and easy than to have the patient remove the sponge, or to do it yourself, whenever you wish to cut off the current. Being provided with this, you will find that when you have a strong current it is best to put the positive electrode, say, in the patient's hand, and put the needle right into the growth in such a manner that it will be on a perfect level with the skin,—not below it nor above it, but on a level with it,—so that when you have traversed the mole the point will emerge exactly at the opposite side on the surface of the skin. When you introduce the point of the needle you will see bubbles of gas escape, this being hydrogen produced by the decomposition of the tissues; and as you gradually push in your needle you will find this gas continuing to escape until the mass assumes a frothy consistence, and the growth itself will be white along the track of the needle. By inserting the needle at different points you will finally arrive at a condition in which

the whole growth will be of a soft consistence, of a white color ; and it is best to leave this alone, for in a short time it will turn black, form a crust, and in a few days will drop off spontaneously, leaving a smooth, red surface. This discoloration will disappear in a few days, and the former site of the mole will be unrecognizable. You will have removed it without leaving any perceptible vestige of its former presence. The action of the current is rather painful for a few minutes, but the galvanic current itself produces more or less anæsthesia of the tissues, so that the operation becomes comparatively painless. The electrolytic action is not a cauterization, but a decomposition. It is destructive only in the fact that it decomposes the tissues, and whatever tissues are placed in contact with the needle are the ones which will be destroyed, and that is the reason that you should always keep your needle perfectly horizontal, or placed upon the surface of the integument, in order not to produce depression at the site of the growth you are endeavoring to destroy. The length of time that will be required to destroy a growth of this character depends almost entirely upon its size, and it may be necessary to recur to the method for several séances in order to complete the destruction. If there be hairs in it, it is best always to remove the mole first ; then whatever hairs remain may also be destroyed by the electrolytic method.

TRICHOPHYTOSIS, LEUCODERMA, AND A CASE OF SYPHILIS.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

BY CHARLES CARY, M.D.,

Professor of Materia Medica, Therapeutics, and Clinical Medicine in the University of Buffalo.

GENTLEMEN,—This boy, whom many of you have seen before in the ward class, has been brought into clinic as an introduction to a series of cases of skin-diseases. The skin is of importance to the general practitioner as an indication of the health of the patient, and many of those things which you are in the habit of recognizing almost unconsciously, such as age, temperament, and general health, are really shown to us by the condition of the skin. The malady from which this patient is suffering is purely of a local and parasitic character, occurring in a child from the orphan asylum, who gives a vague history of having noticed marks on his skin, but he cannot remember that any of his brothers or sisters or other playmates have had anything of the sort.

The disease is trichophytosis, and here, in the hair behind the ear, I show you a patch which is typical. The disease is otherwise known as *tinea tonsurans*, or ringworm, and on account of the locality, *trichophytosis capitis*. The disease is due to the *trichophyton tonsurans*, one of the few fungi which trouble man. This fungus attacks especially the epidermis, and rarely it affects even the nails. The head and face, chest, and back of the hands are all common sites for the growth and development of this parasite, but it may locate almost anywhere. When the disease occurs on the trunk, it is called *tinea* or *trichophytosis corporis*. Barber's itch is due to the same fungus attacking the roots of the beard, and is known as *trichophytosis barbæ*, or *tinea sycosis*, from its resemblance to a fig. This boy has had *tinea corporis* as well as *tinea capitis*, but the eruptions on the body have been cured. The disease is called ringworm from the fact that, occurring on the body, the lesions heal at the centre while progressing outward in the

form of a ring. If seen a few times, and the appearance impressed upon the mind, it is difficult to confuse the disease with anything else. Occurring on the scalp, the fungus invades the hair-follicles; the hairs become dry, disintegrate, and finally break off, leaving a stubble of hair which is quite characteristic. The lesion, however, does not assume quite the characteristic ring which is seen in *tinea corporis*. When found upon a hairy surface, it is difficult to eradicate, as the disease dips into the hair-follicles. On the body it is much easier to cure, although it is apt to return either from fresh infection or from there having been left in the nails or other parts of the body some of the fungus-cells, which are disseminated especially by the finger-nails. It is not a disease accompanied by much itching, but when the surface is warmed by the clothing there is more or less discomfort and itching, with a corresponding temptation to scratch. It is rare, however, to find such nail-marks on a patient affected with this disease as are seen in eczema and some other skin-diseases. I have seen cases of trichophytosis in which there were thirty or forty of these patches which had been implanted on different parts of the body by auto-inoculation from the finger-nails.

The disease is eminently contagious, and is quite apt to exist in several members of the same family. Some of the lower animals are susceptible to it. As to its cure, any parasiticide thoroughly applied is efficient. The remedy which I should place first is chrysarobin, in the proportion of from five to twenty per cent., in an ointment containing lanolin. The strength varies according to the site of the disease and the care with which the case can be watched. In the hospital I should not hesitate to use quite a strong ointment. It should be applied not oftener than once every two days. I must caution you against the careless use of this preparation on the head, as it excites an alarming inflammation,—a dermatitis. The integument swells and assumes in susceptible cases almost the appearance of erysipelas. A certain amount of irritation, however, should be excited, and the ointment must, therefore, be rubbed thoroughly in. If the child proves not to be susceptible to the application, I should rub it in more freely, or, better yet, use a stronger ointment. Nothing will exterminate this disease except diligence in guarding against new points of attack. It is also well, although the practice is not common, to depilate the area invaded by the fungus. Another preparation which is perhaps fully as good as chrysarobin and not requiring the same degree of caution is unguentum hydrargyri ammoniati, which is now being used on this child. It should be used for several consecutive days, morning and night, in

small quantity, till you cause some irritation of the skin, and then it should be suspended for a time. Care should be taken that the mercurial is not used too freely.

Among the more neglected people in whom this disease has existed for some time, and with, consequently, a good deal of scratching and a certain exudation of serum, the affected areas are inclined to become crusted over quite thickly. Under these circumstances the characteristic appearances of the hair-stubble cannot be seen until these crusts have been removed by thorough washing with green soap. In any case the care of the head should receive especial attention.

LEUCODERMA AND PEDICULOSIS.

This man is evidently not enjoying the best of health. The pallor and the pinched appearance of his countenance would lead you to look either for great neglect or serious malady. To look at his hand, mottled as it is, one would naturally pick out these dark patches as indicating some abnormal condition, but on inspecting his neck we find it has a wholesome color of tan, and we must conclude that the white patches both of the neck and of the hands are the abnormal portions. On the back, and especially in the lumbar regions, we find numerous dark spots and also white spots, both in contrast with the normal skin. The small dark spots on the back have no connection with the white patches on the hands. I am inclined to think that the latter represent an unimportant condition, the exact nature of which is not fully understood, called achromism, or albinism, or leucoderma; in other words, white skin. It comes on in patches, and illustrates on a small scale the general condition of the albino. In the albino, the iris, the hair,—in fact, all the cutaneous tissues,—are devoid of pigment. This condition is usually congenital, but may be apparently accidentally acquired. Limited areas of leucoderma are more commonly observed in the colored race, as even the smallest patches are more conspicuous in them. Upon this patient's chin, where the white patch is seen, the hairs are devoid of pigment, but this is not entirely the case in the hands. He states that this condition has existed for twenty-five years, and that it has never troubled him in the least. This is fortunate, for there is no treatment for the disease except to conceal it with cosmetics, and the only indication for treatment is the mental discomfort which the disfigurement produces.

There is a condition of things which is not unlike true leucoderma, and which we may suppose to be the exciting cause in this case, and that is a syphilitic leucoderma. You will find this described in text-

books. One of the characteristics of a syphilitic scar is its pearly whiteness, there being rarely any pigment present. From the history which I am able to gather, I cannot determine that there is any syphilitic element in this case.

The dark spots on the back were much more marked when the patient entered the hospital. With the preconceived idea that these white patches were a syphilitic leucoderma, one would be very apt to consider the dark patches as syphilitic eruptions. These are, however, the rash of pediculosis due to the body-louse, and they have become darkened through long-continued irritation, which causes the skin to become thick and to possess an excess of pigment. The rash is more abundant where the clothes come in direct contact with the body, as about the waist, simply because the body-louse is really a parasite of the vestment and not of the body, breeding and living in the seams of clothing and coming out on the body to feed. It naturally selects for its feeding-grounds those places where the clothes touch the body. The longer the duration of the case the more prominent are the marks, and sometimes they will remain for weeks or months after freedom from pediculosis.

When once a person becomes infested with these creatures it is extremely difficult to get rid of them. Persons in the lower walks of life cannot afford to throw away their clothing, and they can scarcely get rid of these parasites unless they do, for if the clothes once become infested with the insects the victim may be as cleanly as possible and yet he will continue to be afflicted with pediculi. The treatment, therefore, consists in taking care of the body—personal cleanliness—and in destroying or else boiling or baking the clothes.

Neither of these maladies which I have described to you has been the cause of bringing this patient to the hospital. He comes in on account of a trouble with his knee, giving the following history:

Fifty-one years old; born in the United States; clerk. Family history negative; has been well till two weeks ago, when he was out in the rain and his clothes were wet, and he had a severe chill, lasting several hours. Three days after this his left knee began to swell, but it was not very painful except when he walked. He had a similar attack ten years ago, when the trouble began in the bottom of his left foot and extended in two or three days to the knee. The foot, leg, and knee were swollen. He had no fever, but was confined to bed for eighteen days and was incapacitated for work for about two months. In this attack he has no swelling except in the knee, which is four inches larger in circumference than the other.

The patient entered the hospital some days ago with his knee much more swollen than at present; the swelling was rather more above than below the patella, and there was a peculiar lump just above the joint. The knee was flexed to an angle of about 160° . There was fluctuation, which could be felt over a larger area than at present. It was important to determine whether the fluid lay in front of the patella or in the joint-cavity. Outside the patella there is a bursa which enables the integument to move over the bone and which affords great protection when kneeling. If seriously damaged or subjected to too great pressure, it becomes inflamed and swollen with exudate, and is called housemaid's knee. In the present condition, however, the fluid is entirely within the joint, so that the patella is forced away from its resting-place on the femur, and I can elicit the diagnostic sign by pressing the patella downward, producing quite a sharp click when it strikes against the femur. This sign always demonstrates the presence of fluid behind the patella, but, like most other physical signs, the failure to elicit it is not positive proof that the condition does not exist, for the effusion may be so great that the patella cannot be brought down against the femur. A second diagnostic point is the fluctuation developed on palpation. Notice that the synovial sac extends to a point three inches above the patella, whereas a distended prepatellar bursa does not extend so far. Puncture would undoubtedly bring away serum, for I am convinced of the absence of suppuration because there is no local heat and not sufficient of the other signs of inflammation, and because there is no rise of temperature nor acceleration of the pulse.

A bland effusion like this cannot be primary, and there is no immediate history of traumatism or other local cause of inflammation. We must therefore look for some predisposing cause in addition to the exposure to wet and cold which is assigned as the exciting cause of this trouble. A detached fragment of cartilage in the joint, or some depraved constitutional condition, such as rheumatism, or, in particular, the damage left by an old rheumatism, might predispose to this condition. An old traumatism with injury to the ligaments would predispose to such an attack, but as our vague knowledge of the history of the case would lead us to the consideration of a great many hypotheses if we attempted a thorough explanation of the case, let us not discuss the etiology further, but turn our attention to the treatment.

In the first place, this man was put to bed, the indication being plain to rest the joint and to avoid all friction on the synovial membrane. Splinting was not necessary in this case, as the patient was perfectly willing to hold the limb still. Then the limb was elevated so

that the fluid would tend to drain out of the knee through the blood-vessels and lymph-channels, so far as that is possible. Then pressure was applied by means of an elastic bandage,—not enough to cause pain, but enough to keep the vessels constantly under tension and to promote an evacuation of the sac. Later, the knee was painted with iodine once or twice daily, discontinuing it only when it began to cause too much irritation and vesication of the skin. The appearance of the patient shows that a depleting treatment, as by purging, is not indicated as it would be in a robust plethoric man, in whose case we would have recourse to saline cathartics and low diet. On the contrary, there was in this instance a demand for an abundance of food. In the last few days he has been on iron and arsenic for the tonic properties of both and the alterative action of the latter.

The soreness in the knee, which was undoubtedly due to tension, has entirely disappeared, but the underlying cause, upon which this condition depends, has not been removed, and I see no reason at present why the trouble should not recur if his health falls below par and if the knee is used too much. If there are floating cartilages in the joint, which cannot be determined at present while the effusion is so great, I shall advise their removal as being the exciting cause of this trouble. If not, the man must be put on his guard to watch himself carefully, to avoid strain of the joint, and to endeavor to ascertain the underlying cause of his condition.

SYPHILIS.

The points in the history of this case are as follows :

W. M., aged twenty-eight ; United States ; cook ; single ; entered hospital one month ago. Mother died of phthisis. Ten weeks ago patient was seized with a severe headache, there being both frontal and occipital pain, extending down the muscles of the neck and shoulder. Since then he has had frequent attacks of sharp, lancinating pains, worse at night than in the daytime. Never had trouble of the sort before. Thirteen years ago had acute rheumatism ; nine years ago had two attacks of gonorrhœa ; four years ago had erysipelas of the neck. Patient states that the pain is confined to the left side of the forehead.

You have heard the history ; out of the information furnished by it we must, on examination of the patient, select the significant points. The fact that the patient's pain comes on at night more than in the daytime should excite our suspicions at once, and the fact that it is a hemicrania is an additional significant fact. On inquiry, we find that the alleged erysipelas of his neck broke the skin, leaving sev-

eral silvery marks where the pigment is deficient, and which are to be seen still. He has at present a few pustules of the face, which have appeared since he entered the hospital. His nose, you will see, is recurved at the lower portion, and this deformity has developed quite recently.

We must not disregard, however, other suggestions offered by the history. That of rheumatism would invite an examination of the heart to determine if any damage has been done that organ. In the fifth intercostal space, nearly in the nipple line, I hear quite a loud first sound, accompanied by a loud bellows murmur. I also hear at the second costo-chondral junction a systolic murmur which is transmitted up the vessels of the neck, whereas the murmur heard at the base is transmitted upward and outward towards the axilla. Whether the mitral regurgitant and the aortic direct murmurs heard in this case are entirely the result of an old endocarditis, or whether they are in part the result of the vitiation of the blood, I do not know.

I find an irregularity of the right clavicle, which the patient says was not the result of a fracture, but which appeared spontaneously and without pain last year along with several other similar lumps. At present only this osseous node remains.

This man has absolutely denied the possibility of any syphilitic infection, and I have been at a loss to determine what else could have caused these markings on his neck, the hemicrania occurring at night, the appearance of his nose and the history of its change in form, the osseous node on the clavicle,—all of which signs point to the diagnosis of syphilis. Although quite positive of our diagnosis of syphilis, in the absence of absolutely diagnostic markings we determined to wait till the matter was cleared up by further observation or by the patient's own statements. We have learned that the man had previously been in the hospital with a trouble of the nose, which was booked as lupus, but with the note that it was relieved later by potassium iodide. Acting on this suggestion, therefore, we placed the patient on mixed treatment, and he has improved greatly so far as the nocturnal pains are concerned, but he has developed on his face the rash of iodism and has lost somewhat in weight. I am inclined to attribute the marks on the neck to syphilis, but why they should occur only on one side, I do not know. The hemicrania is the symptom of a syphilitic neuritis. On account of his loss of weight and the appearance of the iodine eruption, the antisyphilitic treatment should be interrupted for a time and the patient put on something to improve the condition of the blood, as, for example, a preparation of iron. Later, he must return to antisyphilitic

treatment, for he is now suffering for the second time with an outbreak of neuralgia which has before yielded to mixed treatment. His appetite is good, so that there is no indication for administering stomachics. He should be directed to go out-doors, in order to improve his muscular tone. The condition of the heart must be carefully observed, so as to determine whether the murmurs are aggravated—there is no doubt that there is an organic valvular lesion—by his present weak condition. If this proves to be the case, as we thicken up his blood, so to speak, by tonic treatment, the leakage will be diminished, and not only the murmur but the interference with the cardiac function will be decreased.

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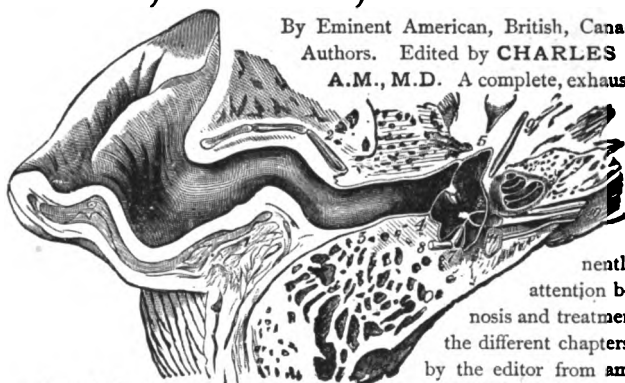
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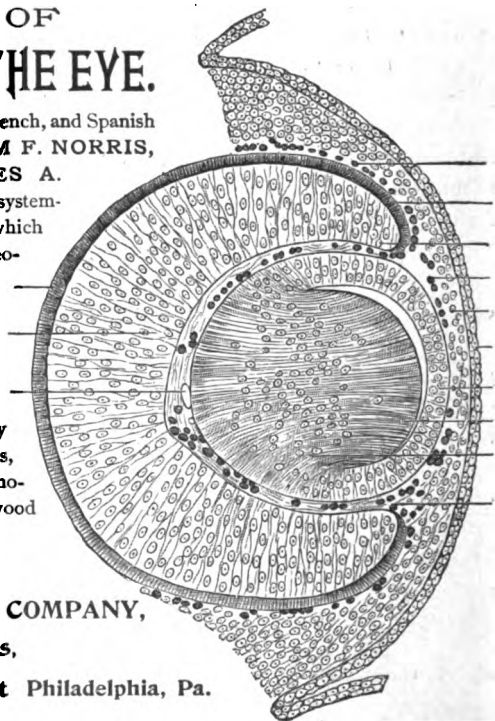
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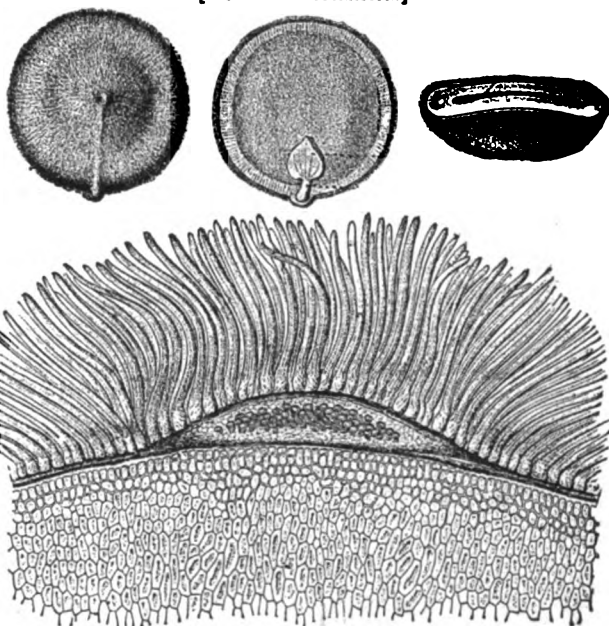
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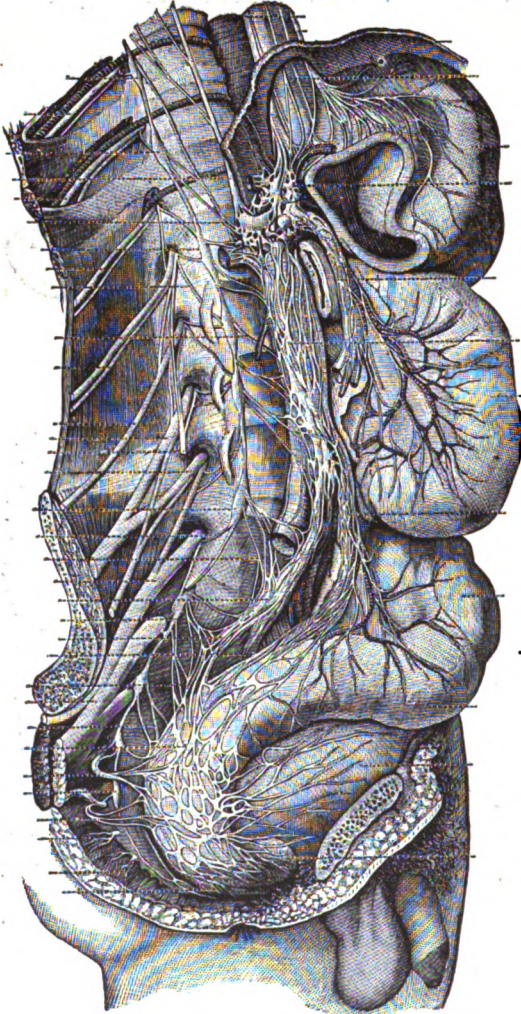
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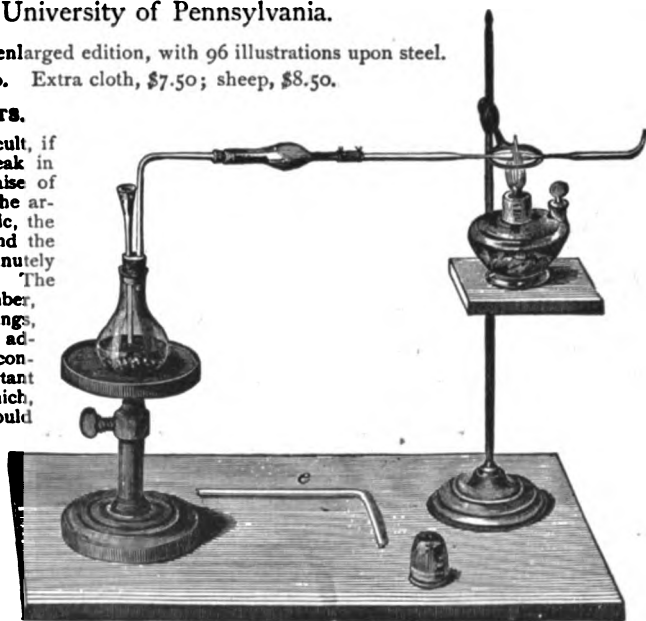
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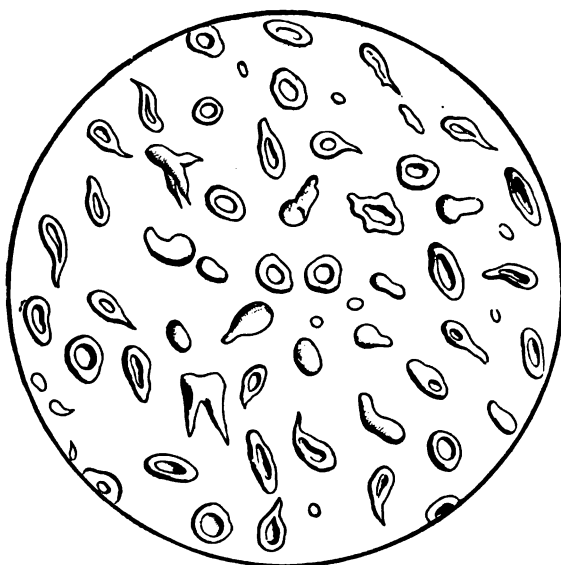
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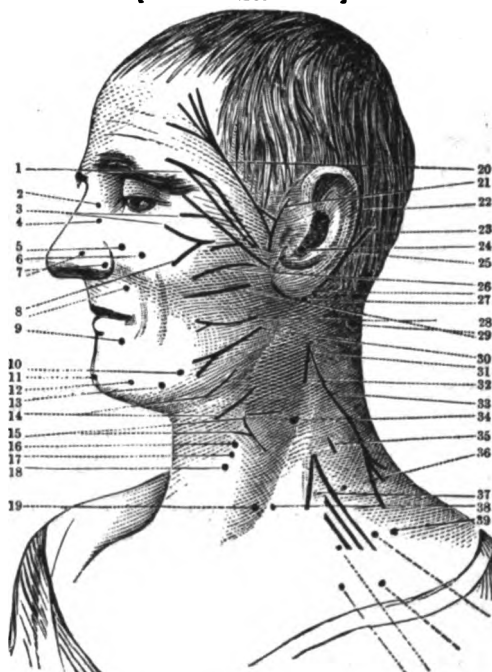
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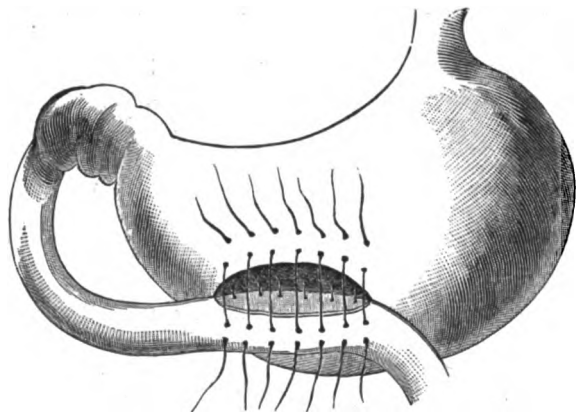
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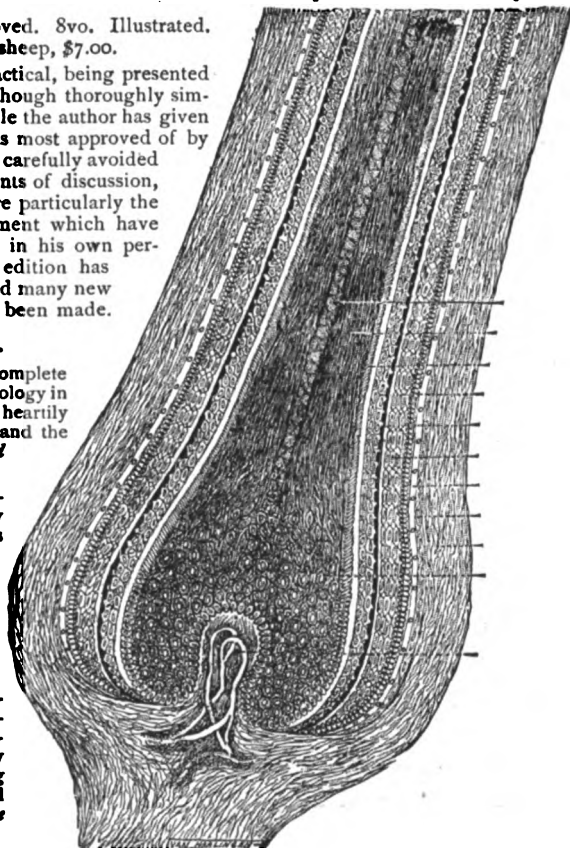


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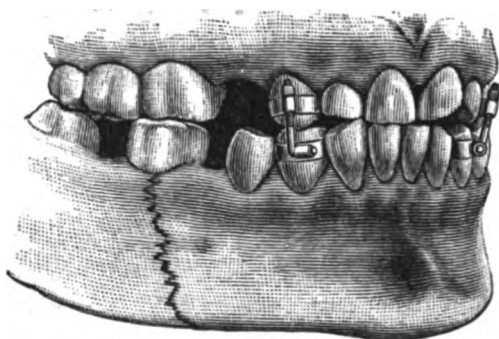
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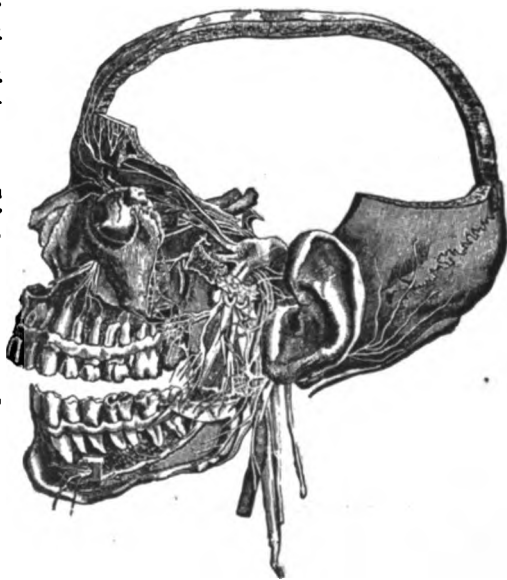
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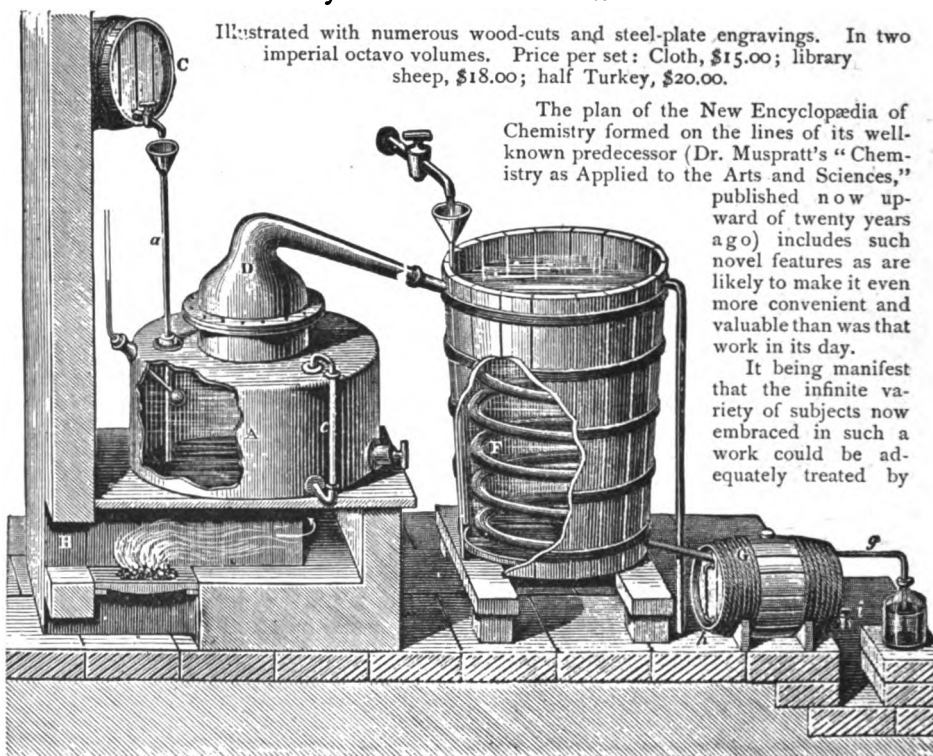
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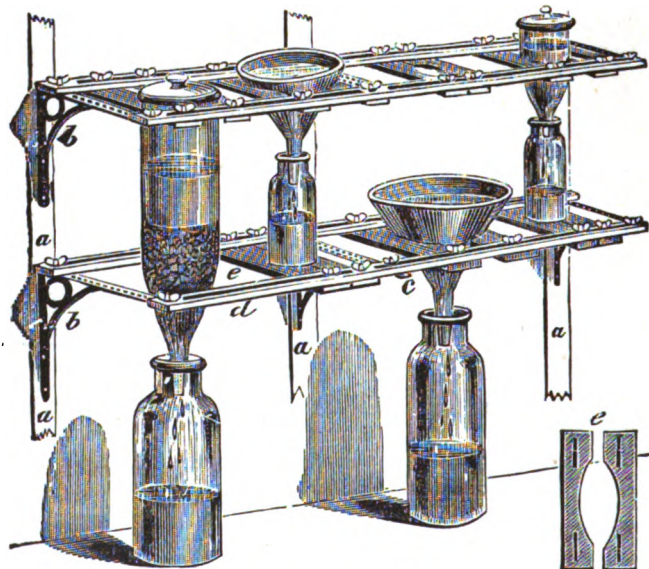
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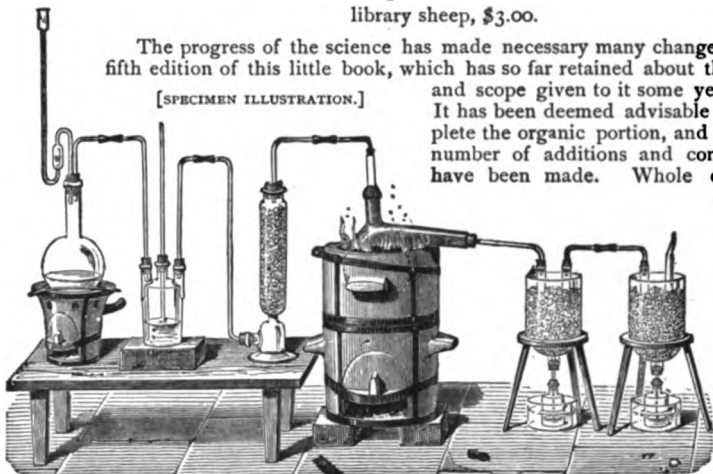
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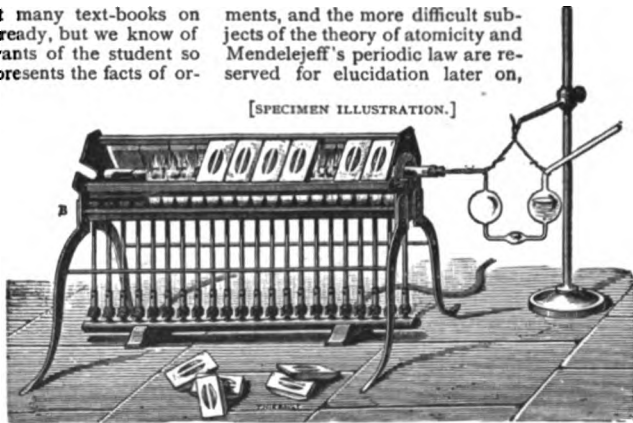
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